THE ARCHITECTURAL REVIEW VOLUME CX NUMBER 657 SEPTEMBER 1951 FIVE SHILLINGS

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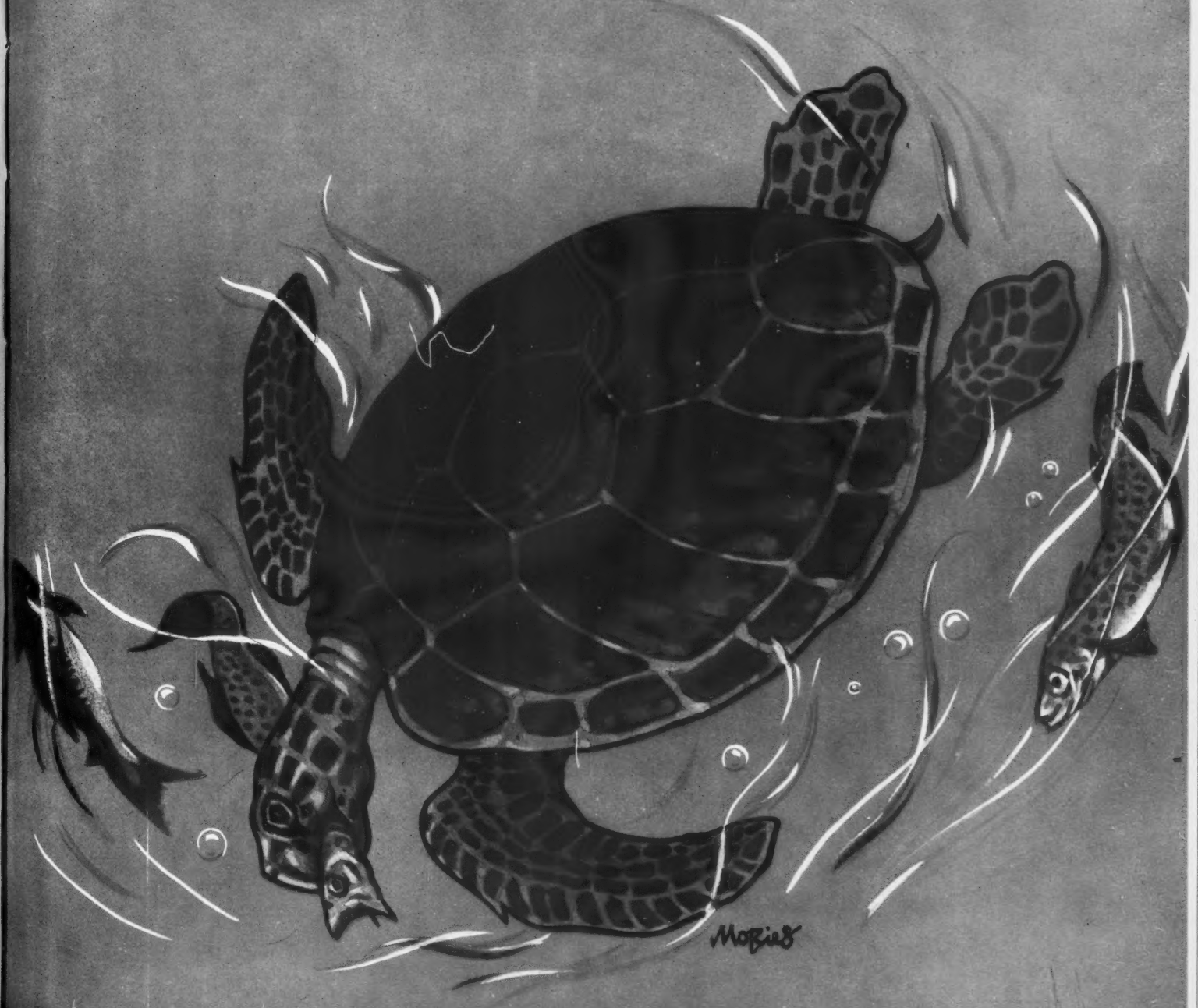

Commemorating many years of PROUD ACHIEVEMENT

MELLOWES AT THE CRYSTAL PALACE

Extract from the Chairman's Report, Crystal Palace Compa
September 1, 1899: 'The roofs have always been a considerab
expense to us to keep in repair, and especially the centre transep
So we called in our consulting engineers, Sir Douglas Fox a
Mr. Cooper, to advise us what had better be done. They advise
that the centre transept should be reglazed. We invited tender
and, acting under the advice of our consulting engineers, w
accepted the tender of Messrs. MELLOWES & CO. of Sheffield

1951

MELLOWES *at the* FESTIVAL

Today, in Festival year, the name MELLOWES recalls links with exhibitions of the past, and presents modern achievements in Patent Glazing and Metal Windows as a sure foundation for the future. The illustration shows an aluminium entrance screen for the Power and Production Pavilion at the South Bank Exhibition, entrusted to them by the Architects, G. Grenfell Baines, Esq., A.R.I.B.A., A.M.T.P.I., in collaboration with H. J. Reifenberg, Esq., Dip.Ing.Arch.

MELLOWES & COMPANY LIMITED

LONDON SHEFFIELD

Reproduced from: THE BOOK OF ENGLISH TRADES & *Library of the Useful Arts*, 1821

THE CARPENTER

As the carpenter works, the sweet smell of wood shavings fills the air. Smoothing the rippled grain of fresh - planed wood, he caresses Beauty herself. The burring saw, the hissing plane, the tapping hammer are music to his ears . . .

AND CRAFTSMANSHIP LIVES ON *With the coming of the Industrial Revolution and the development of machinery, the era of the lone craftsman passed into history. No longer was one man single master of his trade. Instead, the work was divided among specialists, each one a craftsman in his own particular line. To-day, the individual is an expert, whose specialised skill is an essential part of the whole.*

★ ★

AT CELLON we believe in the essence of craftsmanship. For example, after a new decorative finish has been produced by our laboratory specialists, it is tested by experts who examine every Cellon product under the conditions of use for which it is intended. Like the carpenter of old, who by the skill of his craft released the pent-up genius of wood, we always strive for perfection in our finished work.

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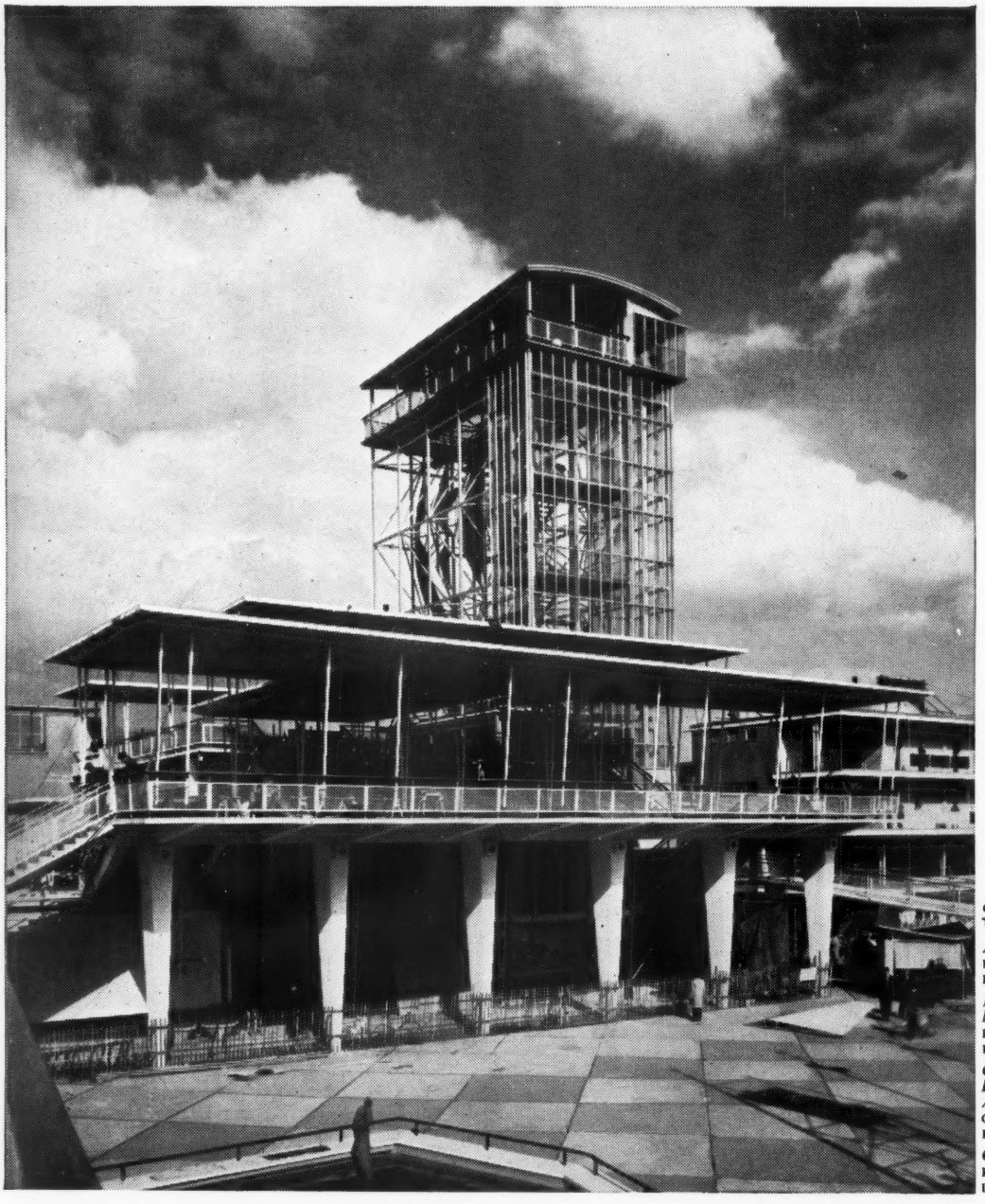


OBSERVATION TOWER

Architects: FRY, DREW & PARTNERS.

Main Consulting Engineers: R. T. JAMES & PARTNERS

Consulting Engineers to Architects: OVE ARUP & PARTNERS

Contractors: KIRK & KIRK LTD.

FESTIVAL LOOK-OUT FOR LONDON

The observation tower of the South Bank site gives visitors a chance to have a look at London. And what is better than that the tower should be clothed in glass so that there is visibility all the way up. To achieve this, Jane Drew, F.R.I.B.A., the architect, surrounded the tower with Aluminex Patent Glazing produced by Williams and Williams. Aluminex Patent Glazing is an aluminium glazing system that is being used all over the world to produce walls of glass. It is evident, as these photographs show, that Aluminex in the hands of architects of imagination has many interesting possibilities.

The 90ft. high tower is clad on three sides with 32 ounce clear sheet glass, held in a web composed of Aluminex glazing bars, and horizontal weathering sections of standard design. The weathering sections consist of Z-shaped extrusions and are designed so as not to detract from the clean vertical lines of the tower.

Anodised Aluminex

The architect was anxious to secure a decorative matt finish to the aluminium

and this was achieved by chemical etching and anodising, a special process which was carried out by Anodising & Platings Ltd., of Radcliffe, Lancashire.

Transport Pavilion

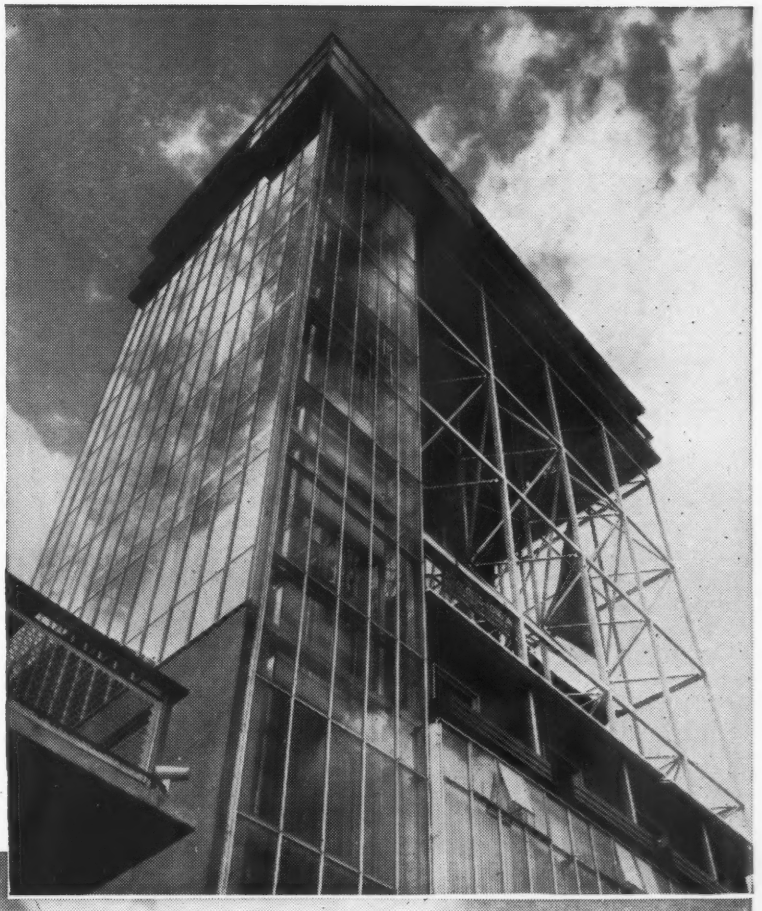
One of the most interesting aspects of the Transport Pavilion (shewn below) is the use of various glazing methods as a means of producing architectural contrasts. Below the 100 foot three tier continuous Aluminex opening lights (operated by a single manual Teleflex control) there is a range of six foot deep plate glass windows in aluminium surrounds. Butted against the end of the Aluminex wall are small pane industrial sash windows glazed with reeded glass. All were produced by Williams and Williams.

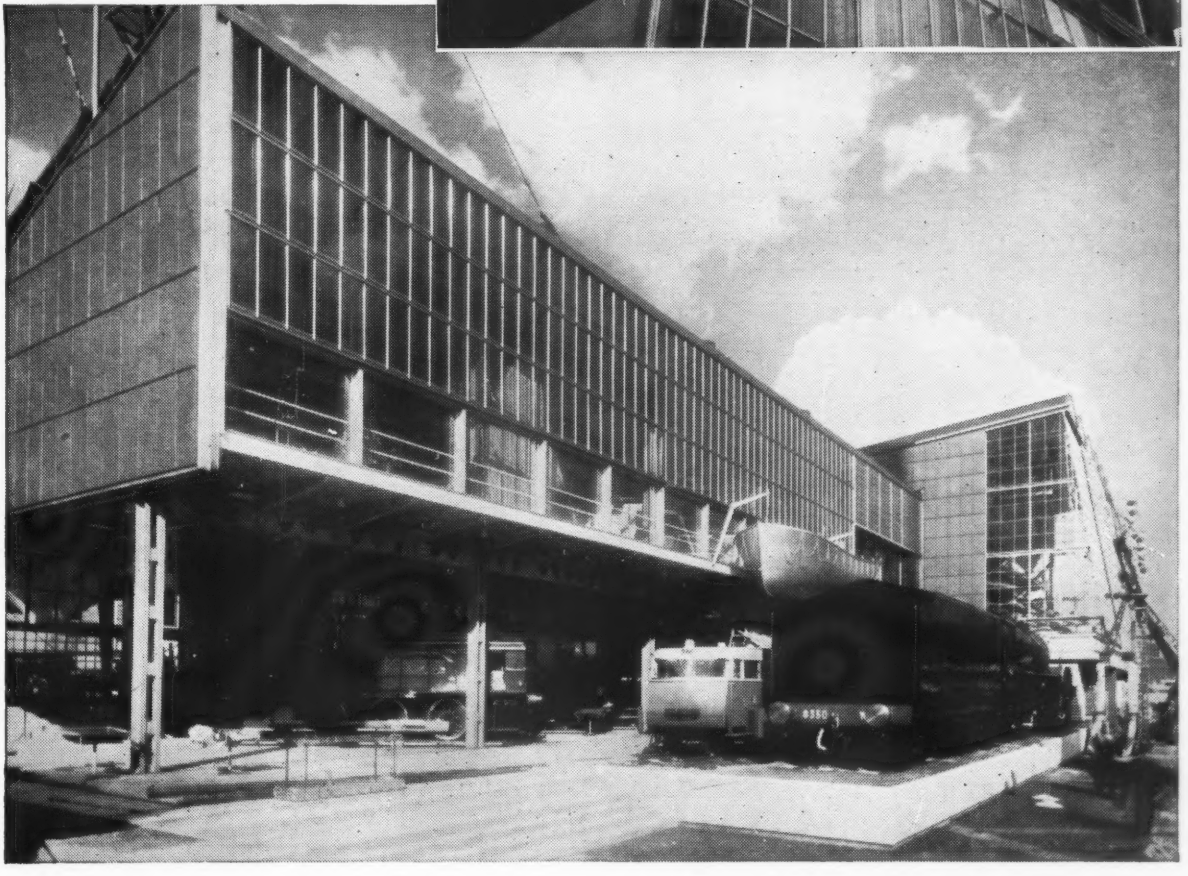
In the background one can see the main building of the Pavilion. The face of this building which measures 45 feet by 100 feet, is completely clad in Williams and Williams steel windows.

Williams and Williams Ltd

RELIANCE WORKS · CHESTER

TRANSPORT PAVILION *Architects:* ARCON. *Main Consulting Engineers:* FREEMAN FOX & PARTNERS. *Consulting Engineers to Architects:* FELIX J. SAMUELY *in collaboration with* H. GOTTFELDT. *Contractors:* RICHARD COSTAIN LTD.





As the building industry increasingly realises the pleasing effects and the simplification in constructional methods made possible by the use of plywood—for partitions and panelling, floors, doors and ceilings, counter fronts and tops, built-in cupboards, the sheathing of radiators, and its many other applications indoors and out—more and more builders are turning to "Thamesply" because it is *very good plywood indeed.*

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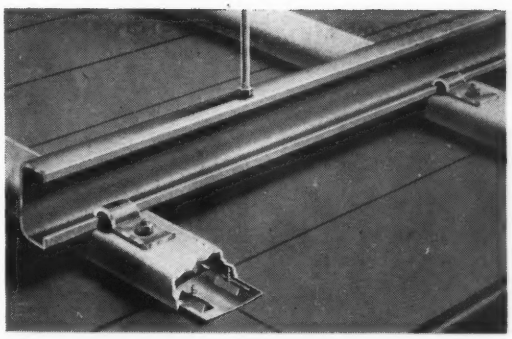

It is now possible to make oneself heard above the clatter of crockery and kitchen noises in this Canteen—the ceiling has been treated with Acousti-Celotex Tiles.

Canteens and Restaurants represent some of the many applications of sound-absorbing materials which are being installed by the Cullum staff. Offices, Factories and Schoolrooms with sound-absorbent treatment on ceilings or walls also give quieter conditions. Illustrated alongside is the Cullum Channel Fixing System showing the method for forming suspended ceilings with Acousti-Celotex Tiles. A coloured brochure with full details will be posted on request or a practical expert will be pleased to call.

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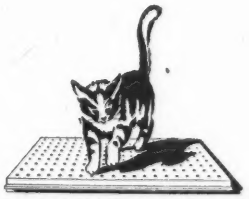

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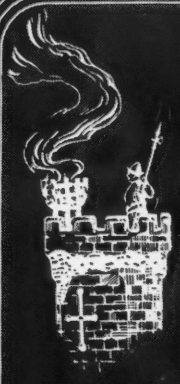

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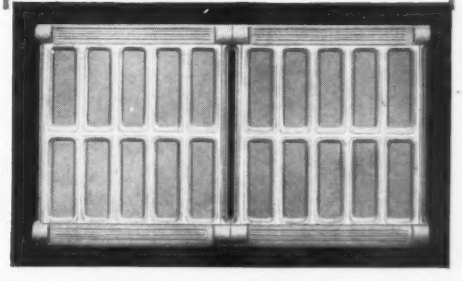

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no 'noise-fatigue' here!

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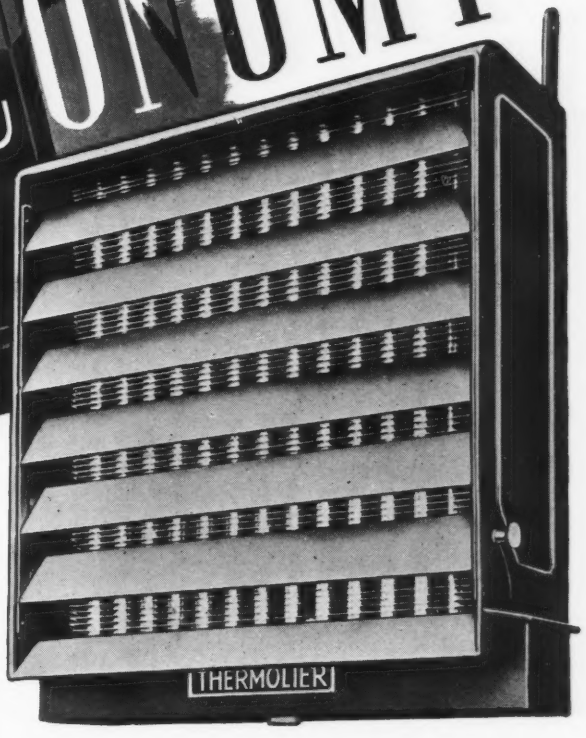

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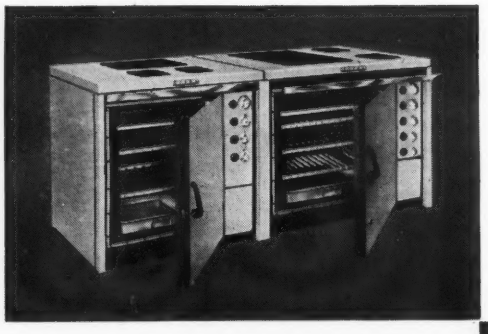

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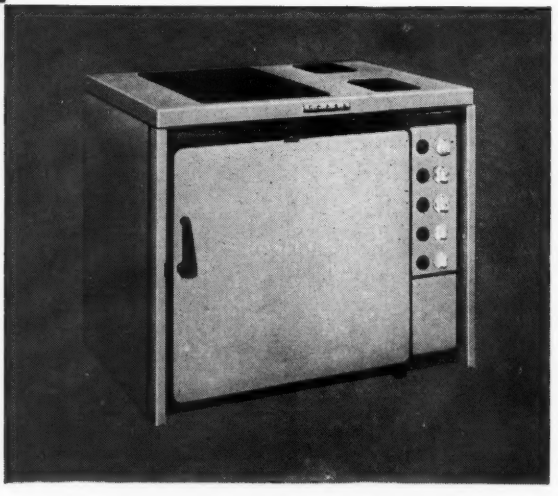

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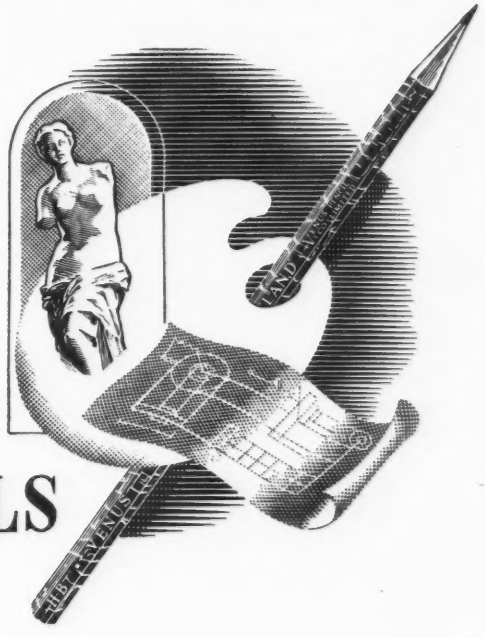

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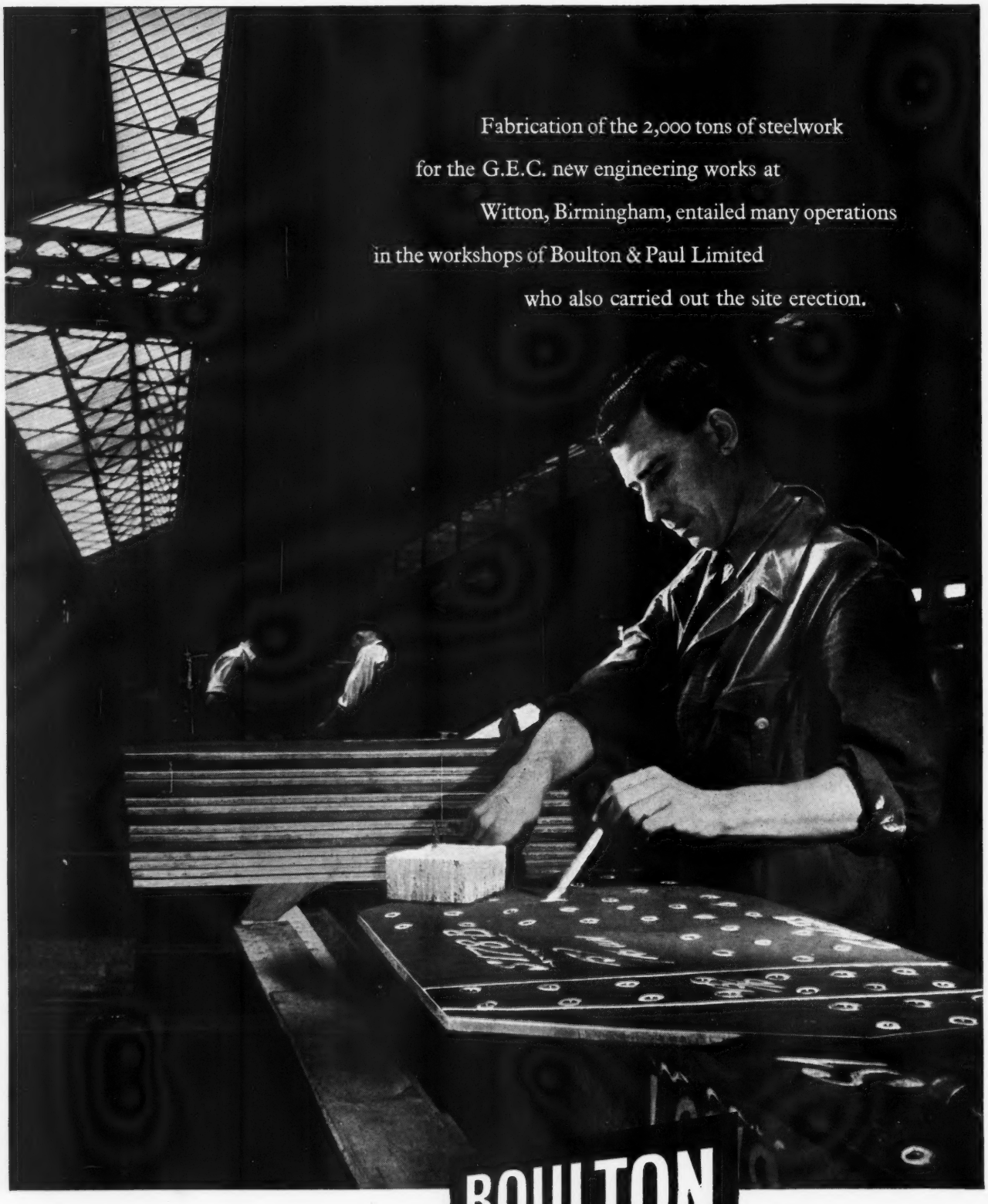
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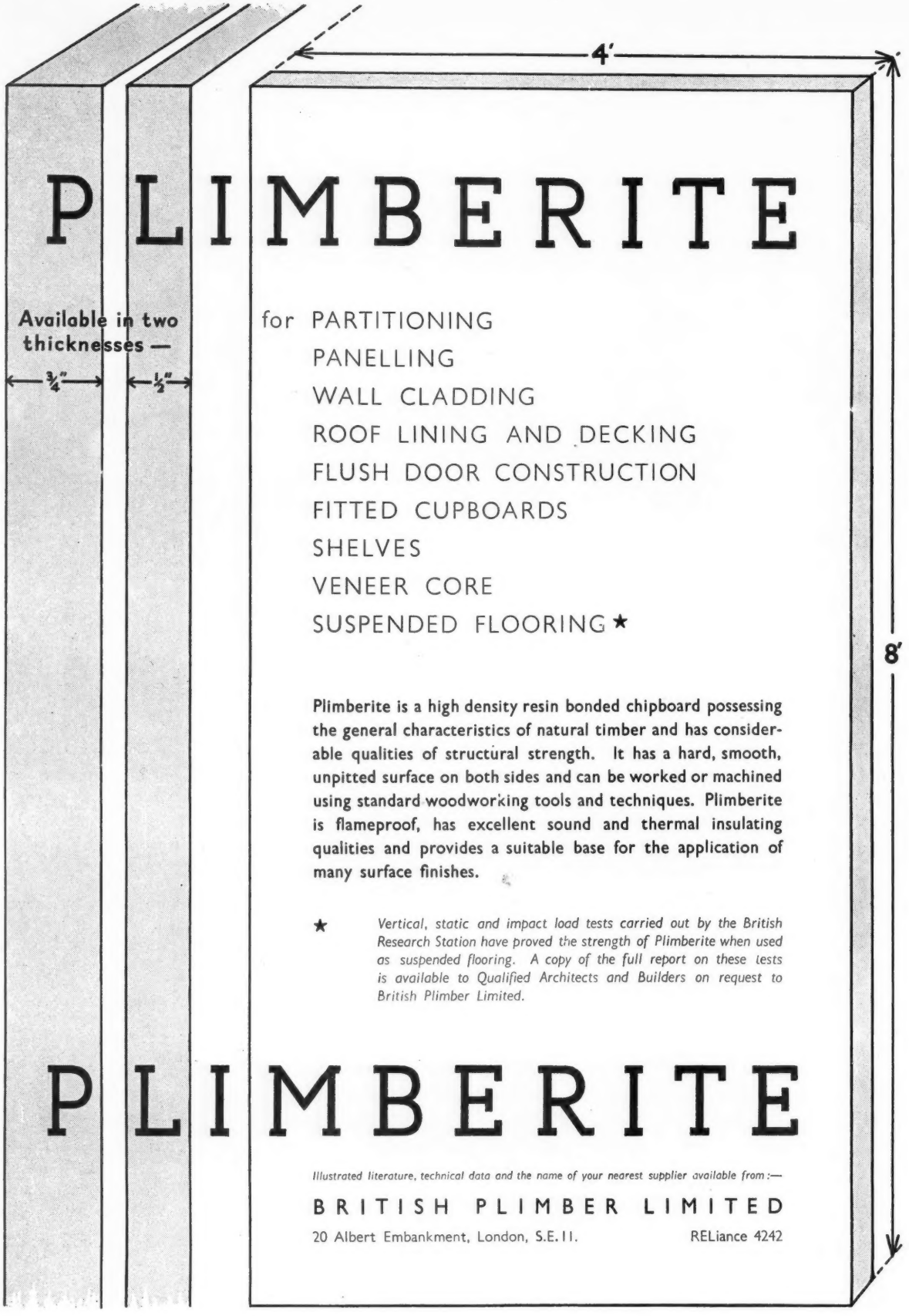

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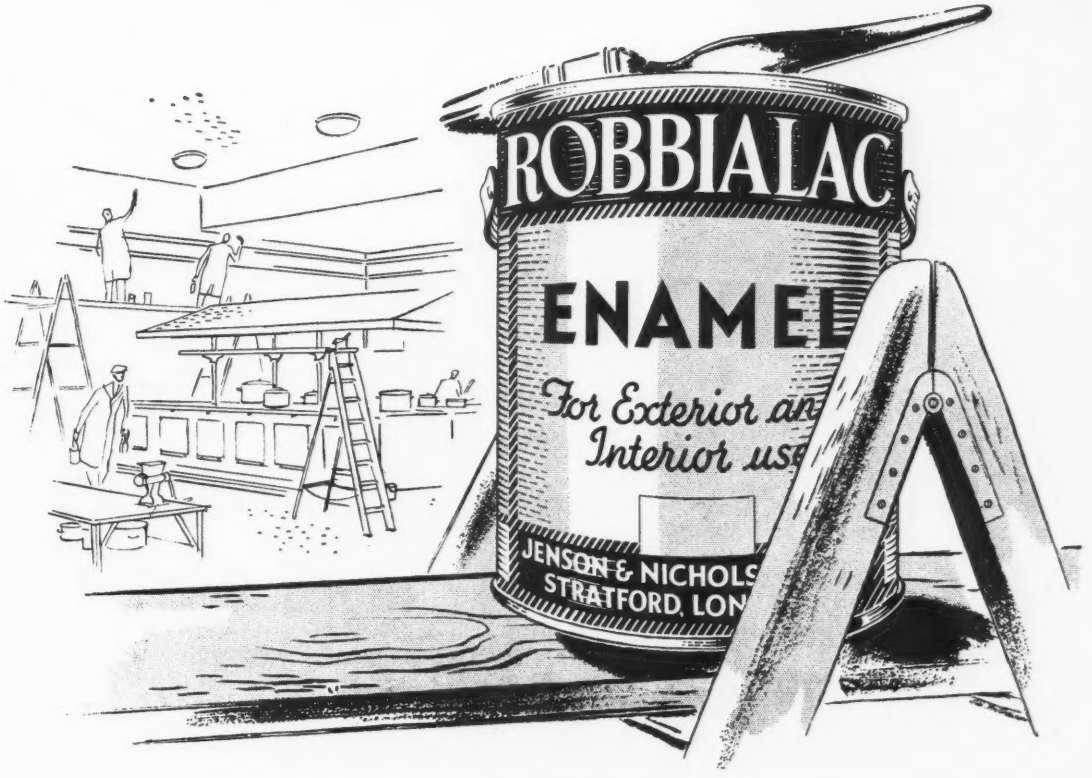

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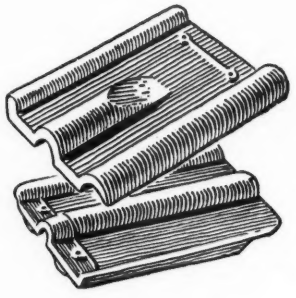

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This Finch Division of Roofing Specialists offers the architect and builder the most comprehensive selection of roof covering in the country. The range includes tiles and slates in an extremely wide choice of patterns; and a large stock of corrugated asbestos roofing (complete with fittings) especially suitable for Industrial and Agricultural buildings.

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Finch's supply not only the material but the men to do the job. Their large staff of highly skilled Fixers enables them to carry a contract through to efficient completion, at competitive prices.

Any requirements, however unusual, can be met by this Division, and men with roofing problems cannot do better than write or telephone the Finch Organization.

More and more architects and builders are finding their problems answered in the Finch advertisements.

Finch advertising puts them in touch with the finest and most comprehensive building supply service in the country—the Finch Specialist Divisions. Each advertisement deals with one of these teams of experts in particular, and describes in general the meticulous attention that the Finch service gives to more abnormal requirements, such as unusual specifications, special deliveries, etc. Whatever your problem one of the *fifteen* Finch Divisions can help solve it.

Specialist Divisions in: Sanitary Appliances and Plumbers' Brasswork . Fireplaces . Stoves and Ranges . Ironmongery . Tubes and Fittings . Kitchen Equipment . Soil and Drainage . Oils, Paint and Wallpaper . Tools and Hardware . Heavy Building Materials . Roof Tiling, Slating and Asbestos . Wall and Floor Tiling . Glazing and Leaded Lights Constructional Engineering . Agricultural Buildings and Equipment.

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A new material or product does not come into general use through any sudden whim, or overnight change of opinion, but through cumulative evidence as to its behaviour from job after job over a long period. It is because of such evidence, establishing beyond controversy that it can be relied upon for a uniform high performance under the most exacting conditions, that for all general building purposes it has become standard practice to specify

Phorpres bricks are available in a very wide range of standard specials. Particulars of these may be obtained from the Technical and Research Department who are at your service for information or advice on brickwork problems.

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Telephone: Holborn 8282. *Midland District Office:* Prudential Buildings, St. Philip's Place, Birmingham, 3 Telephone: Colmore 4141. *South Western District Office:* 11 Orchard Street, Bristol, 1 Telephone: Bristol 23004/5. *Northern District Office:* Gascoigne Street, Boar Lane, Leeds 1 Telephone: Leeds 20771.

BY APPOINTMENT BRICKMAKERS TO H.M. THE KING

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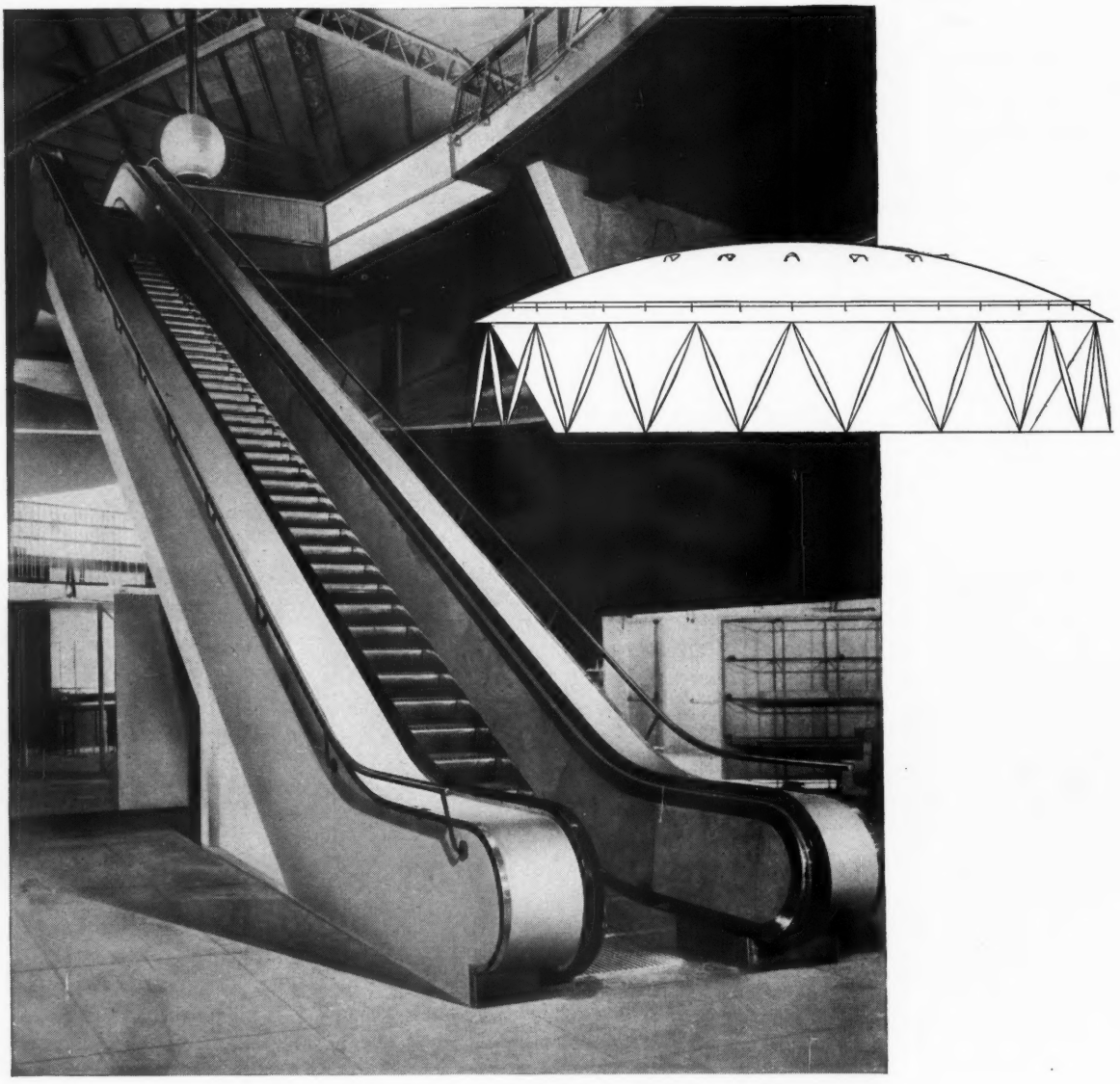

J. & E. Hall designed, manufactured and installed the Escalator in the Dome of Discovery, South Bank Exhibition, which has the largest unsupported span of any escalator in the World.
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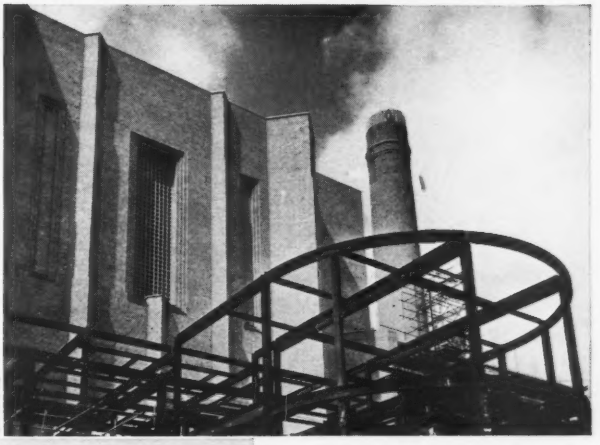
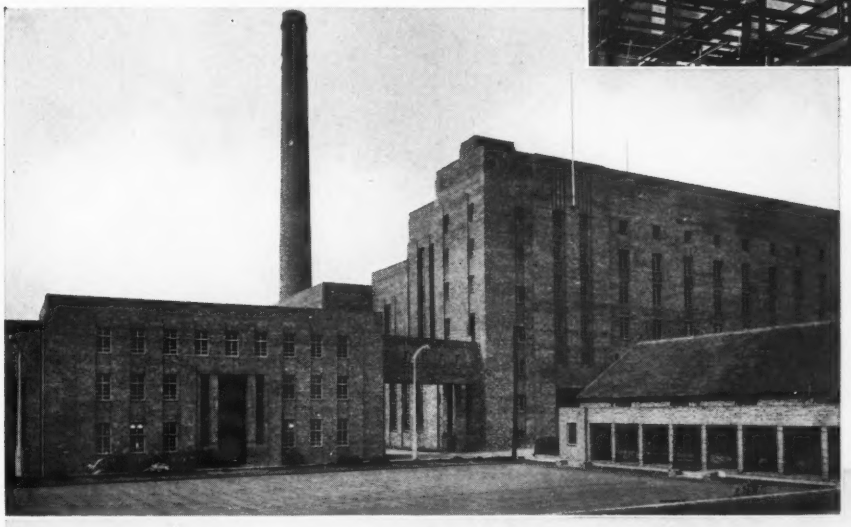
Where are the BRICKS going?

4: POWER STATIONS

The new generating stations are of massive proportions and necessarily conspicuous. They have received much thought from the aesthetic standpoint, and the bricks used have been carefully selected to harmonise with their surroundings.

The high-priority requirements of the British Electricity Authority, added to the urgent demands for Houses and Flats, Schools, Office Blocks, Industrial and many other types of building, have taxed the resources of the brick industry. Production is increasing in the face of many difficulties, and a steady improvement in the supply position is assured.

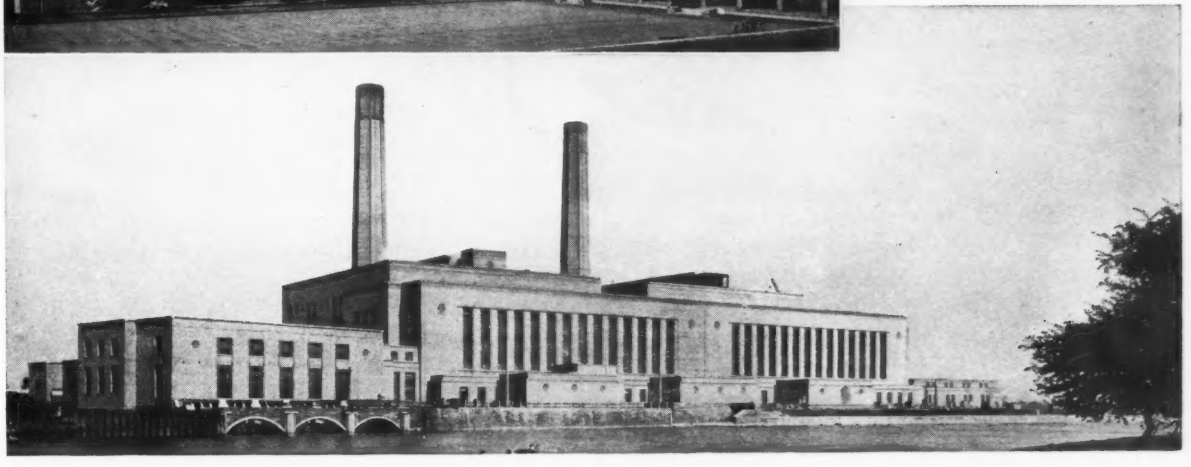




Above: Portion of Croydon Power Station, under construction. Architect: Robert Atkinson, F.R.I.B.A.

Left: Stourport 'B' Power Station. Architects: Farmer & Dark, F/F.R.I.B.A.

Below: Staythorpe Power Station. Architect: T. Cecil Howitt, D.S.O., O.B.E., F.R.I.B.A.

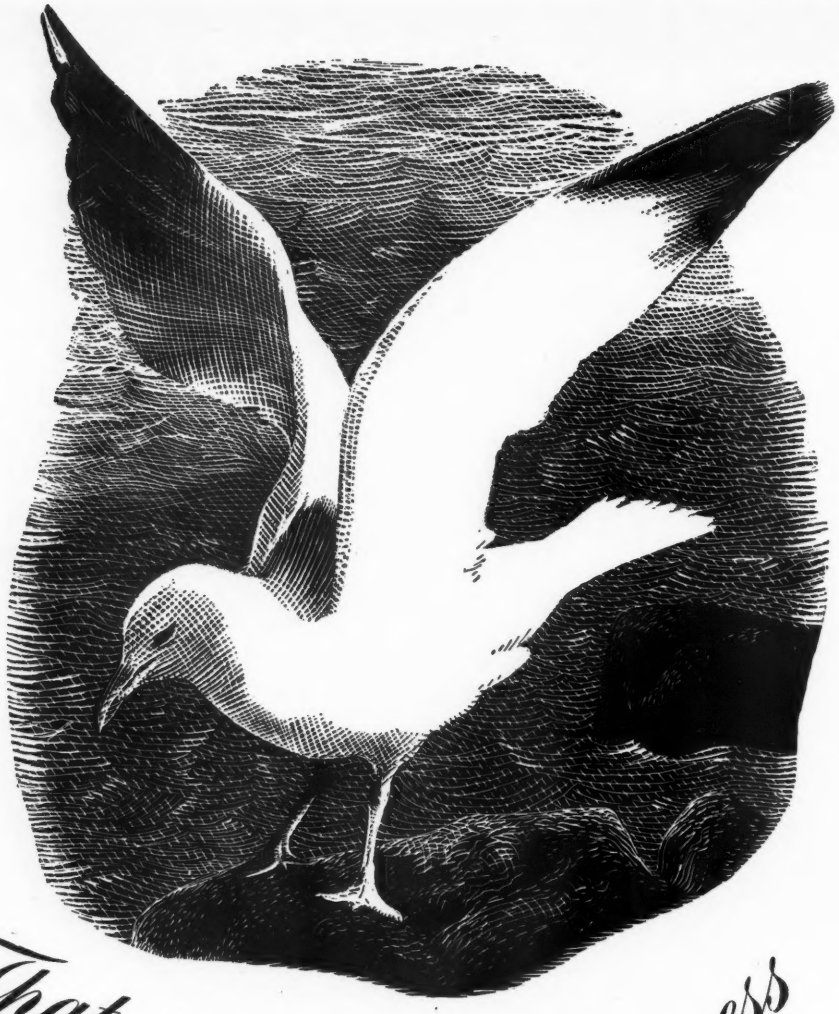


Photographs by courtesy of British Electricity Authority

BRICK

The Modern Building Material

Issued by The National Federation of Clay Industries, Drayton House, W.C.1



That arresting Whiteness

The contrast of pure white on a dark background is as compelling as the most exotic colour scheme. With Snowcrete the architect and builder can emphasise individual features or impart a pristine whiteness to the entire building. Snowcrete is used for producing renderings, facings, terazzo and cast stone of great durability.

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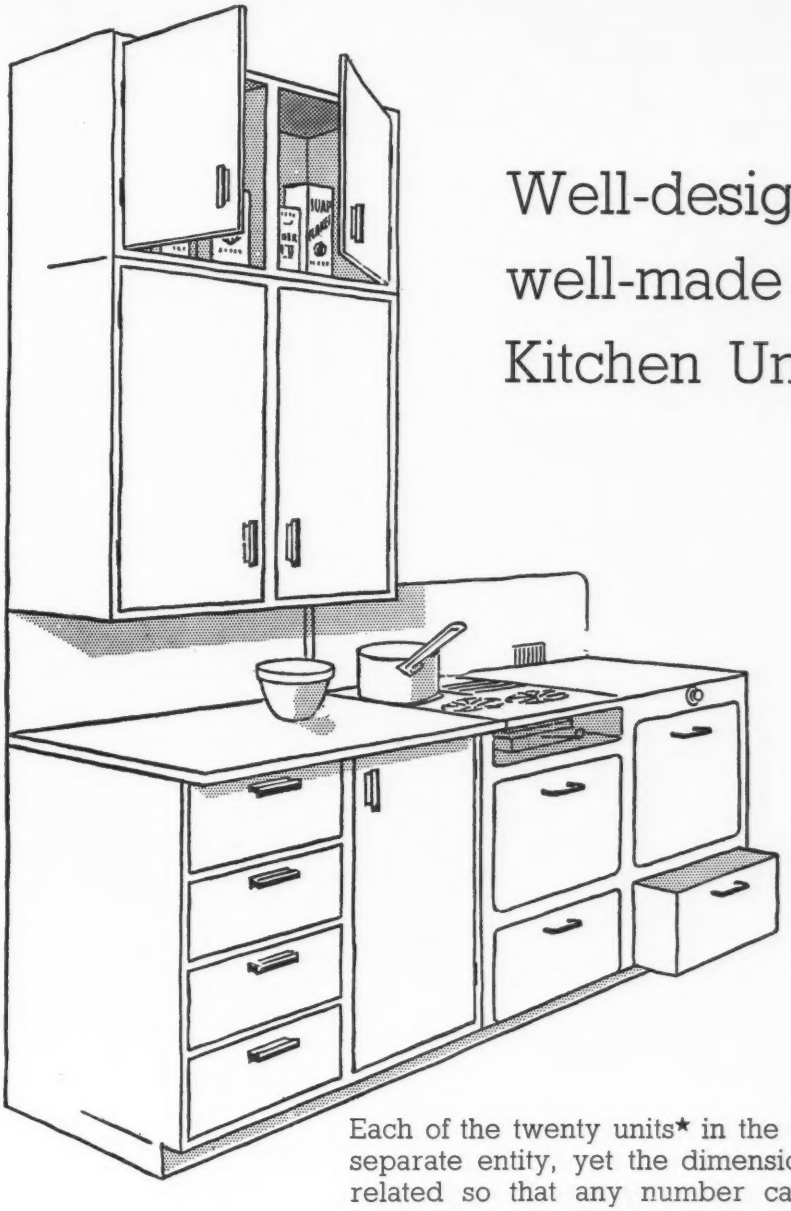

Well-designed, well-made Kitchen Units

Each of the twenty units★ in the EJMA range is a separate entity, yet the dimensions are carefully related so that any number can be combined together in a limitless variety of ways to make the best use of the space available.

Made by precision methods from selected materials these units maintain the high standard of quality for which Sadd's joinery is well-known.

★ To supplement this range Sadds have designed a special sink unit to take a standard size stainless steel sink with single or double draining boards. Write for complete catalogue of kitchen units.

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In restaurants, bars and cafés where smart appearance counts for so much in attracting custom, and durability is essential to keep down maintenance costs, Tygan woven fabric is a natural choice for the upholstery. It wears wonderfully, is washable and is available in a wide range of pleasing colours and designs.

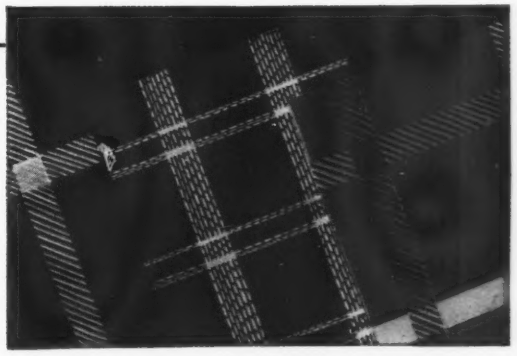
FREE FOLDER Send today to the address below for this free folder giving fuller details and patterns of Tygan, quoting Ref. J.7.

It's washable. *Tygan can be wiped clean with a damp cloth as easily as a glass-top table. Being non-absorbent it is never damp.*

Tygan WOVEN FABRIC

SMART LOOKING | EASILY CLEANED | LONG LASTING

MANUFACTURED BY
Fothergill & Harvey Ltd., Harvester House, Peter St., Manchester 2.



Attractive colours and designs. *The lovely clear colours and smart designs in which Tygan is available afford every opportunity for the achievement of successful decorative effects.*

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R 32

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Available coal often means local coal, and the Riley Stoker is designed to burn with the maximum efficiency coals from all parts of the country. It stokes mechanically and controls boiler temperatures automatically. And along with the saving it makes on coal goes the advantage of smokeless combustion. Moreover, the Riley is extremely robust —most parts are of heavy cast iron—and there is a model to suit every normal type of boiler. Let us send you a full description in Booklet R.461B.

Fuel saving is automatic with RILEY STOKERS.

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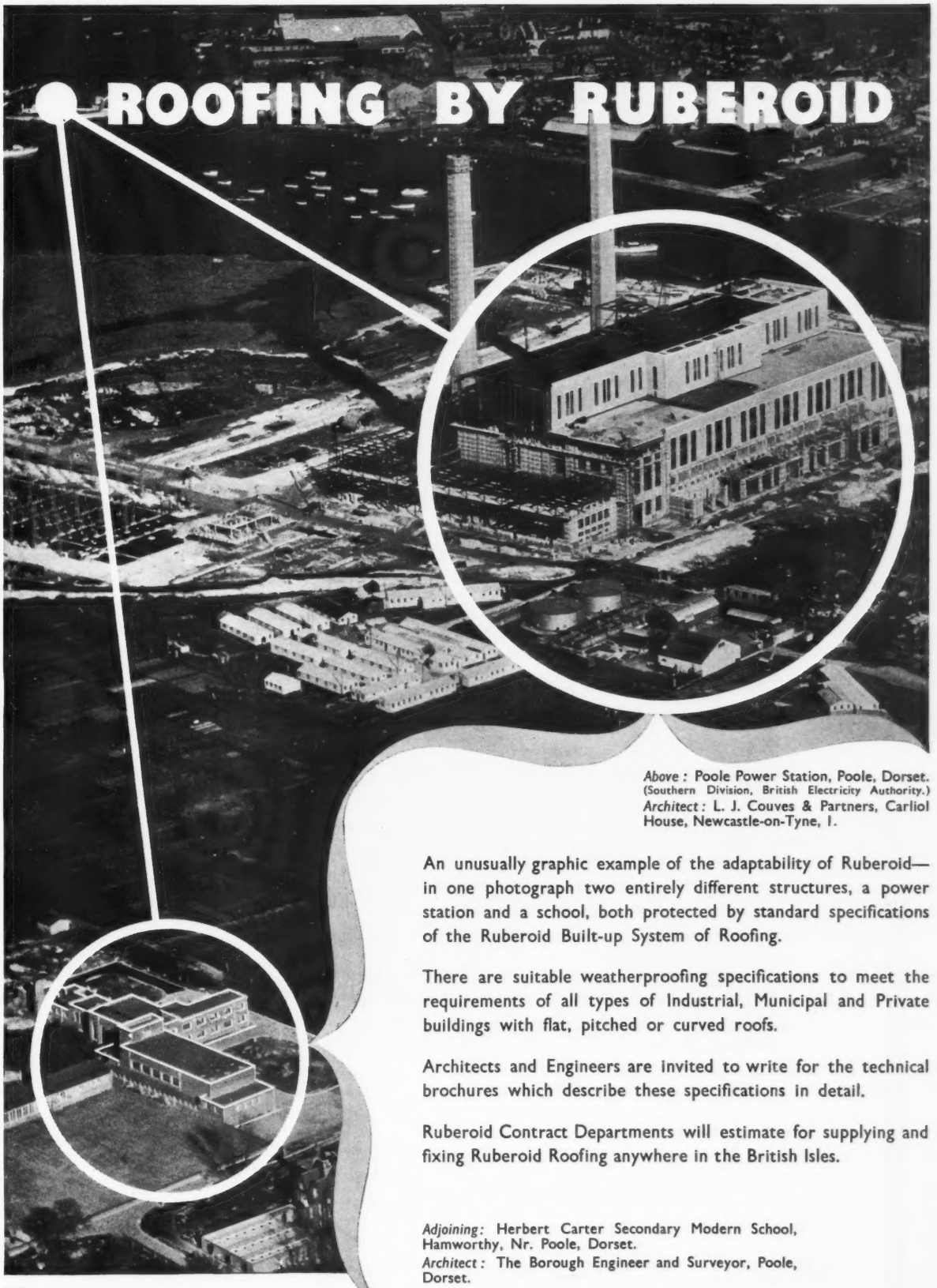
ROOFING BY RUBEROID



Above : Poole Power Station, Poole, Dorset. (Southern Division, British Electricity Authority.)
Architect : L. J. Couves & Partners, Carliol House, Newcastle-on-Tyne, 1.

An unusually graphic example of the adaptability of Ruberoid—in one photograph two entirely different structures, a power station and a school, both protected by standard specifications of the Ruberoid Built-up System of Roofing.

There are suitable weatherproofing specifications to meet the requirements of all types of Industrial, Municipal and Private buildings with flat, pitched or curved roofs.

Architects and Engineers are invited to write for the technical brochures which describe these specifications in detail.

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Adjoining: Herbert Carter Secondary Modern School, Hamworthy, Nr. Poole, Dorset.
Architect : The Borough Engineer and Surveyor, Poole, Dorset.

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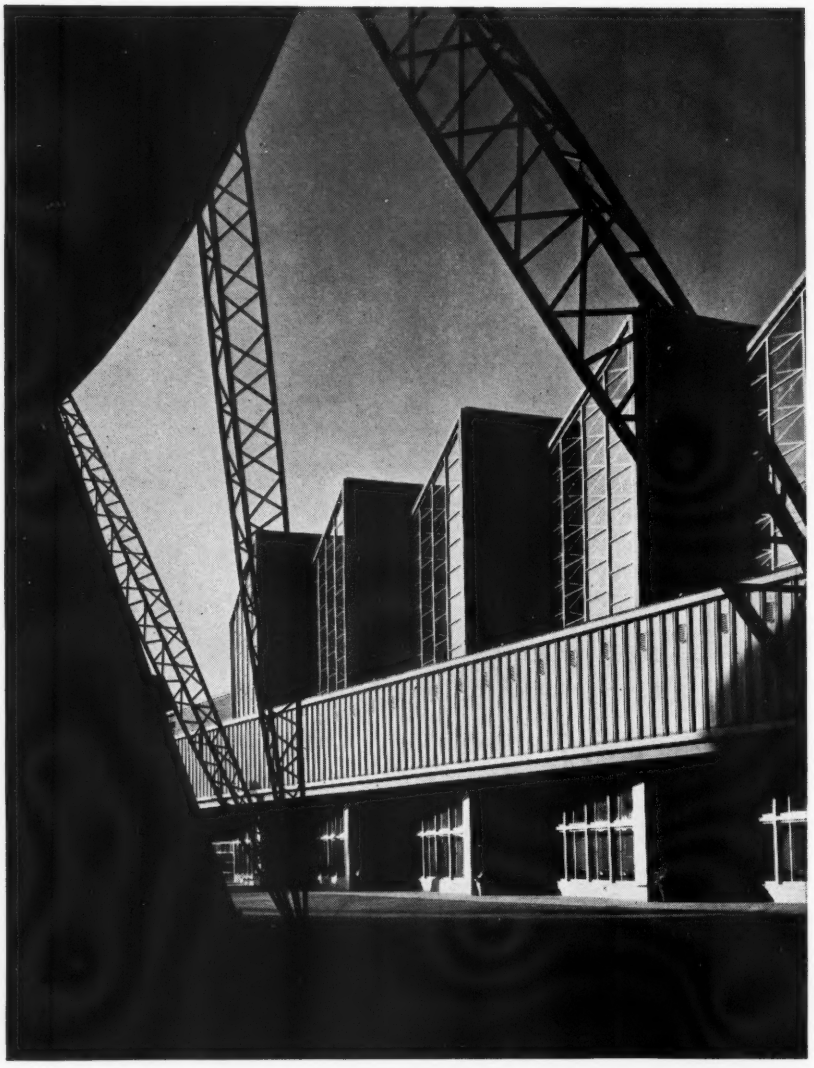
CRITTALL WINDOWS

IN THE FESTIVAL YEAR



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GEORGE GRENFELL BAINES, A.R.I.B.A., in collaboration with H. J. REIFENBERG, DIPL. ING. ARCH., Architects
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Hydro, Harrogate

That sightseers visit the kitchens of His Late Majesty, King Henry VIII at Hampton Court Palace, or those of big ships at sea, is common knowledge.

Less well known but more worth knowing is the fact that the Manager of the Hydro Hotel, Harrogate, regularly takes guests on tours of *his* kitchens. It is perhaps scarcely necessary to add that these are equipped throughout by Radiation (Large Cooking Equipment) Ltd.

Would you be willing to conduct such regular "Cook's Tours" of *your* hotel or canteen kitchens? If not, write at once to address below for full details of the Radiation Service of Kitchen Planning Engineers — a service which is available entirely without obligation to all who are concerned or likely to be concerned with the kitchens of large establishments.

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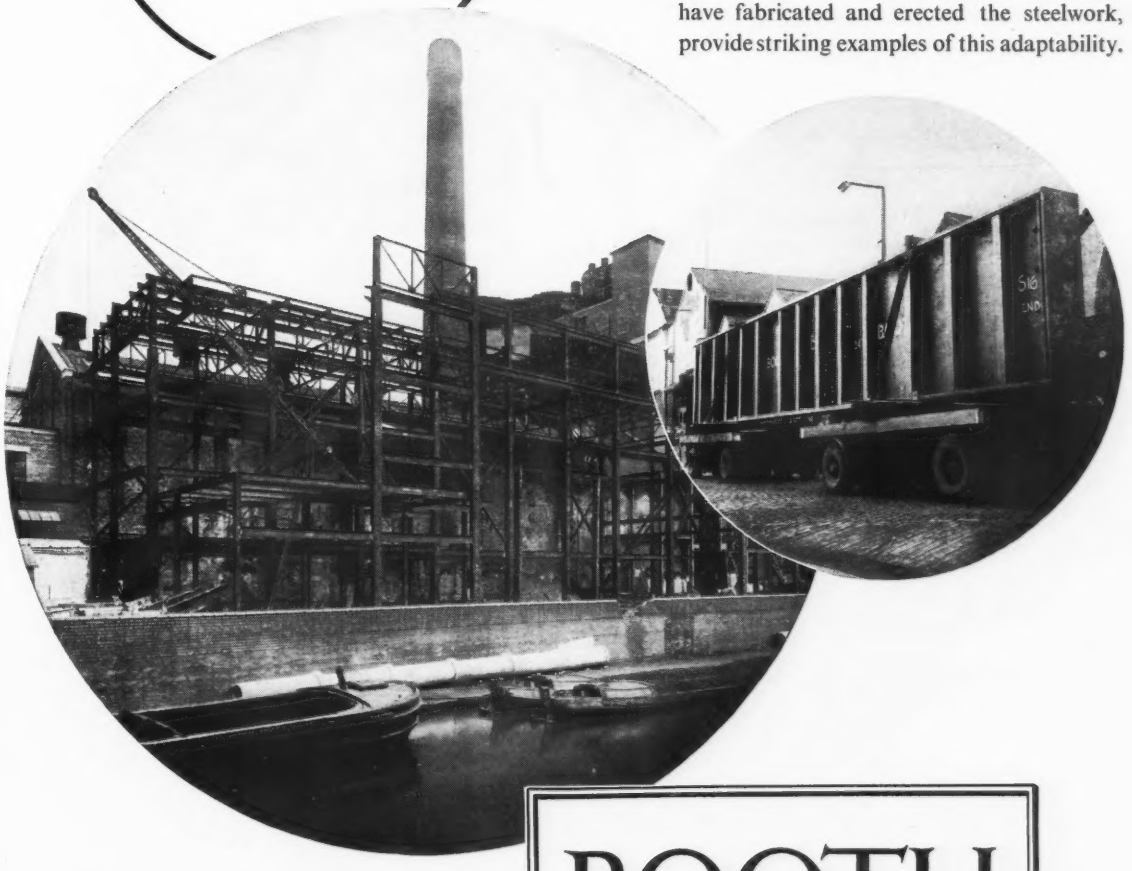

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Take fluorescent lighting for example.
We thought that architects realised the tremendous advances
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But apparently some still judge it by 1946 standards.
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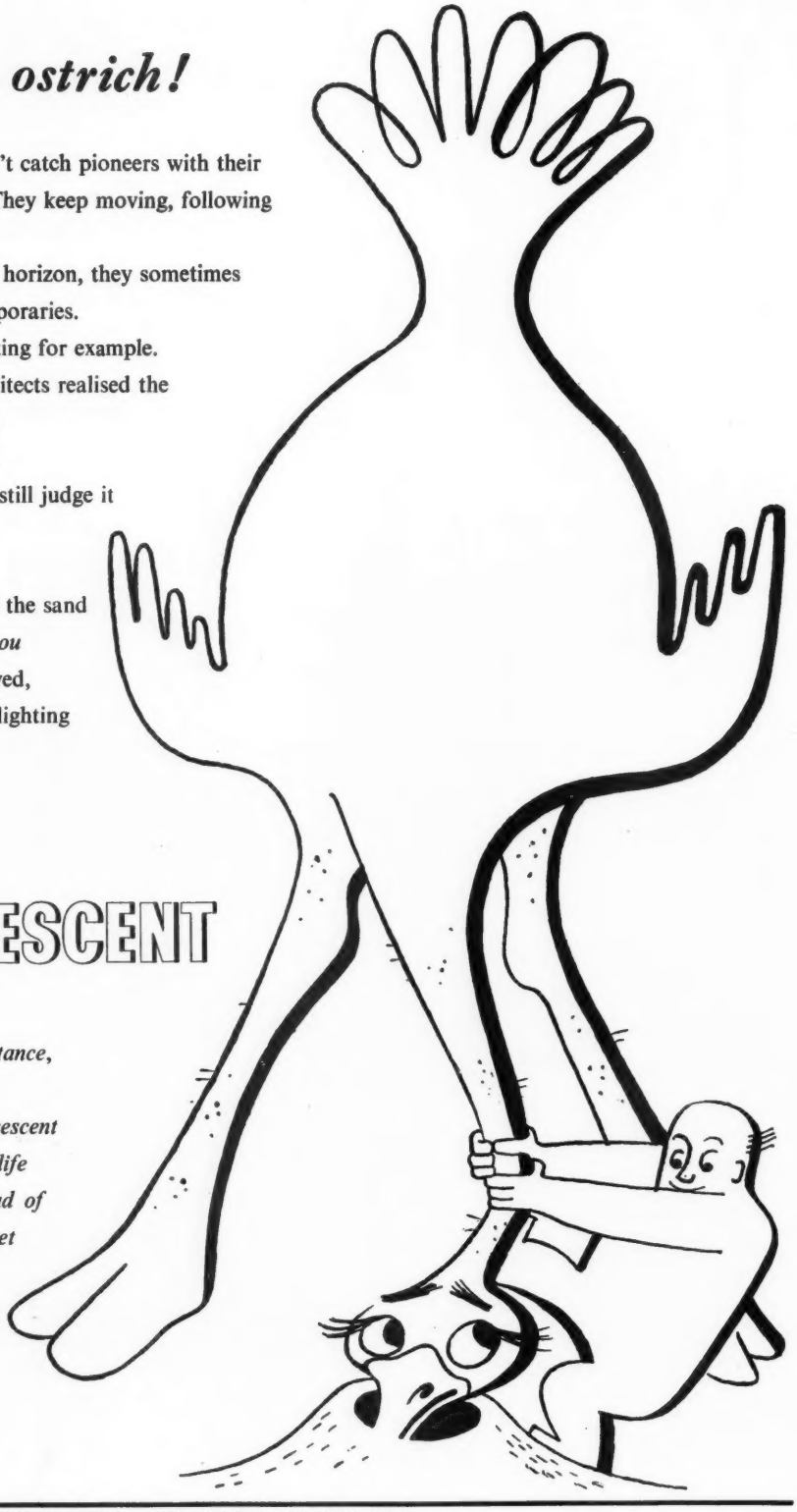
Long ago you flicked the sand from your eyes and *you* appreciate the improved, versatile, fluorescent lighting of *today*.



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A Glimpse of the Past

The massive architecture of the lost Aztec civilisation remains a subject for debate and further research.

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Modern buildings may not have to last quite so long, though their origin will puzzle no one. Many of those which serve the community today and many more which will enhance the future are the work of Edward Wood & Co. Ltd. The illustration below is of a 200 ft. girder for a bus depot.

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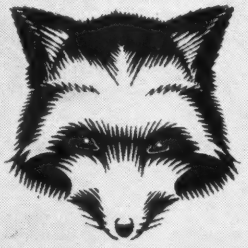

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In plant for the preparation and processing of food, dairy products, brewing and all activities requiring scrupulous cleanliness, "Silver Fox" Stainless Steel gives a smooth, polished, germ-inhibiting surface, free from attack by food acids, easily cleaned, obviously clean.

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FOR THE DOME OF DISCOVERY FESTIVAL OF BRITAIN

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Architect: Ralph Tubbs, A.R.I.B.A.
Contractors: Messrs. Richard Costain & Co. Ltd.

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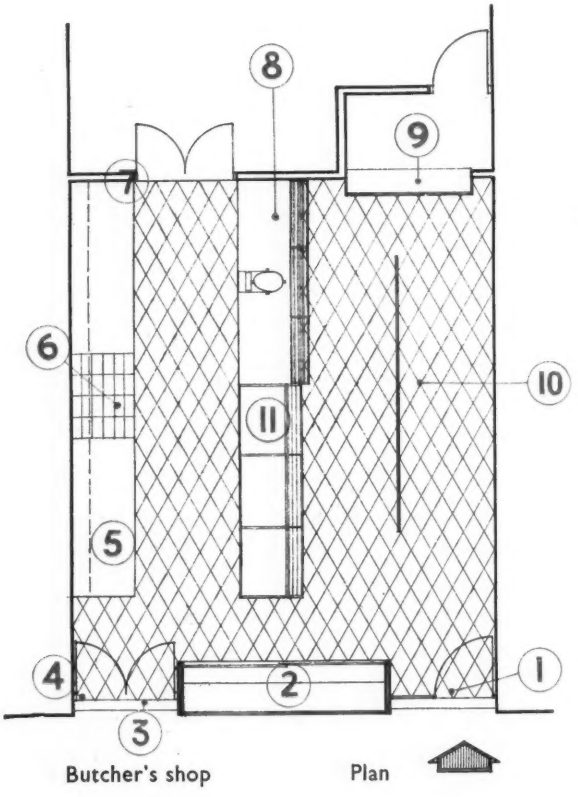
DESIGN FOR

NEW TYPE OF BUTCHER'S SHOP

THE problem of protecting foodstuffs that are displayed and stored in shops is basically an architectural problem, which may be solved by good design and the use of appropriate materials. Here is one solution, which provides new standards of hygiene: a butcher's shop designed by Edward D. Mills, F.R.I.B.A.

Specification of Materials



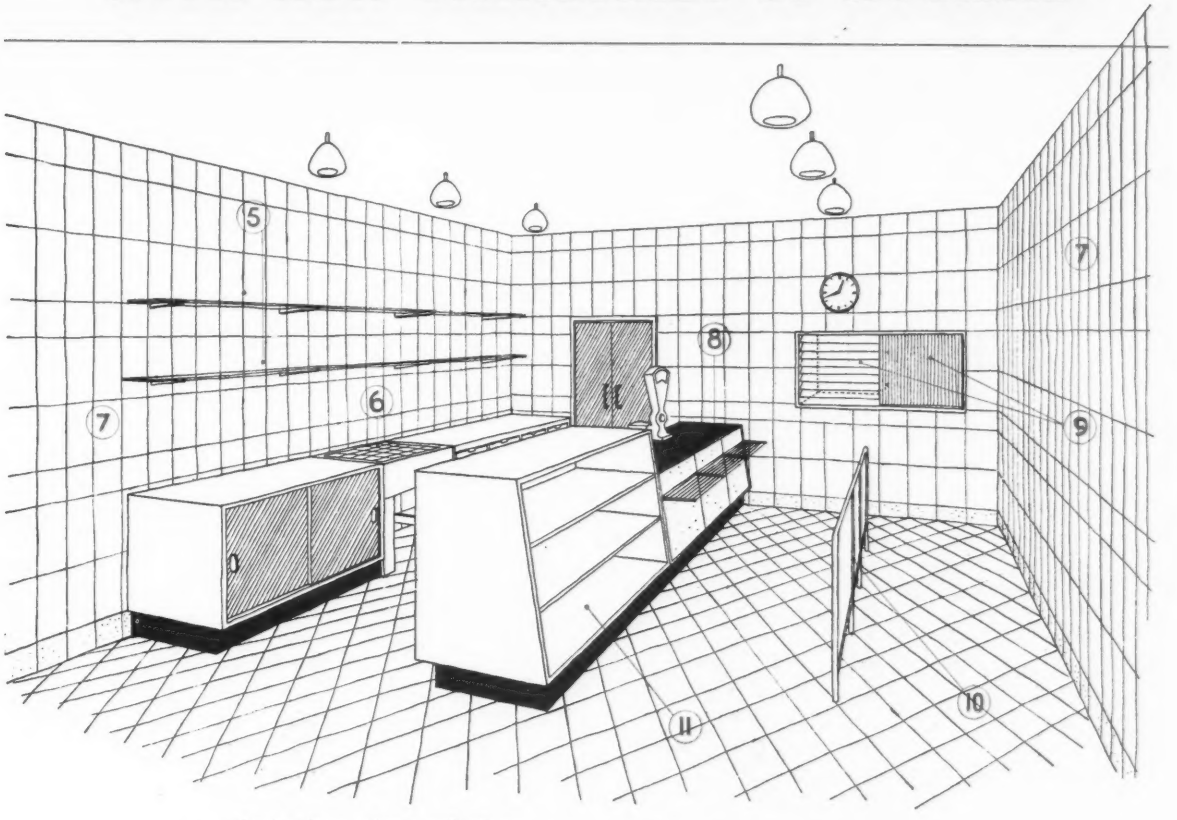
Butcher's shop Plan

SCALE 1/8" = 1'-0"

1. Entrance doors, standard frameless "ARMOURPLATE" glass door with "ARMOURPLATE" glass side panel.
2. Terrazzo shop window surround glazed with "INSULIGHT" Double Glazing. Base covered with "VITROLITE" laid to fall. Lower sliding doors on shop side, frameless "ARMOURPLATE" glass, upper sliding doors, wood frame with flyscreen mesh infilling.
3. Service doors and shop front stall board faced with vertical hardwood boarding. Hardwood transome glazed with polished plate glass.
4. Reveals to shop front surround faced with white "VITROLITE".
5. "ARMOURPLATE" glass shelves on brackets at 4 foot centres.
6. Hardwood chopping block cutting bench, and storage unit.
7. All walls faced with white "VITROLITE" in standard ashlar sizes.
8. Weighing and wrapping counter, ½" rough cast glass top, timber substructure with "VITROLITE" facing, and tubular metal bag rail.
9. Cashier's desk glazed with "ARMOURPLATE" glass louvres and one-way striped silvered polished plate.
10. Barrier rail in tubular metal with georgian polished wired glass panels.
11. Refrigerated display cabinet faced on top and sides with white "VITROLITE". Front "INSULIGHT" triple glazing unit. Insulated doors at rear, polished plate glass shelves. Refrigeration unit housed under adjoining counter (8).

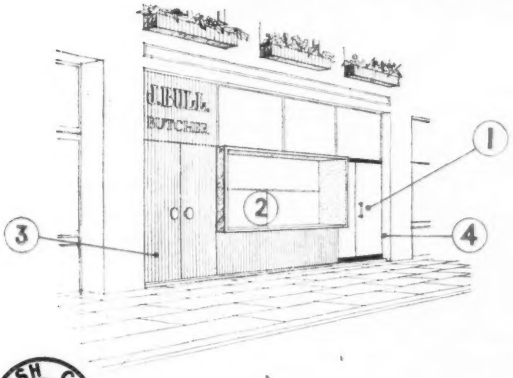
PROTECTION

WITH NEW STANDARDS OF HYGIENE



Above: Interior view of shop. *(See plan and specification on opposite page.)*

Below: Perspective of Exterior.



Designed by Edward D. Mills, F.R.I.B.A.

Consult the Technical Sales and Service Department at St. Helens, Lancs., or Selwyn House, Cleveland Row, St. James's, London, S.W.1. Telephones: St. Helens 4001, Whitehall 5672-6.

"ARMOURPLATE" and "VITROLITE" are the registered trade marks of Pilkington Brothers Limited. "INSULIGHT" is the British registered trade mark of Pilkington Brothers Limited.

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Schools, hospitals, factories and public buildings all over the country are being assured of the highest standards of hygiene and durability in their washrooms by the installation of "Standard" Sanitary Appliances. *The illustration shows a range of Surrey Lavatories fitted on wall brackets.*

"Standard" SANITARY APPLIANCES

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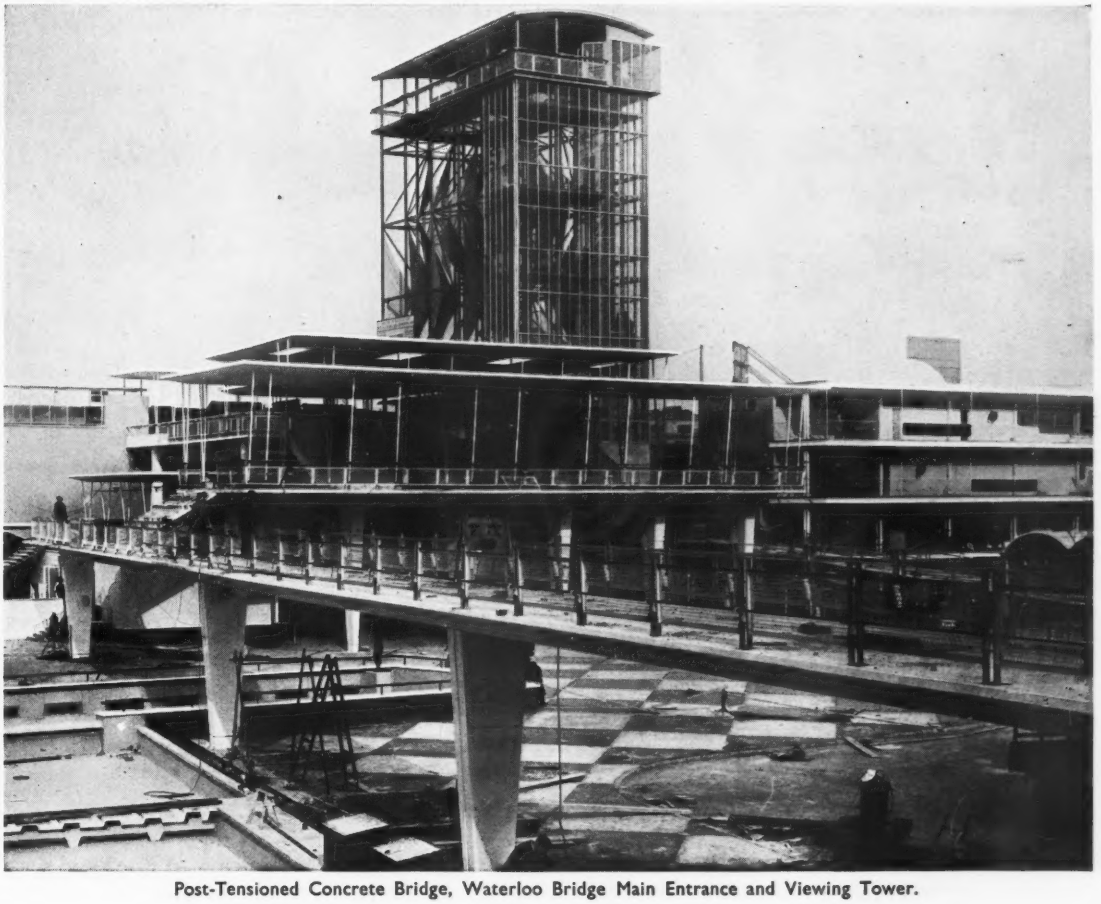
KIRK & KIRK LTD.

BUILDING & CIVIL ENGINEERING CONTRACTORS



Post-Tensioned Concrete Bridge, Waterloo Bridge Main Entrance and Viewing Tower.

Architects: FRY, DREW & PARTNERS, F/F.R.I.B.A.

Consulting Engineers: FREEMAN, FOX & PARTNERS; R. T. JAMES & PARTNERS; OVE ARUP & PARTNERS

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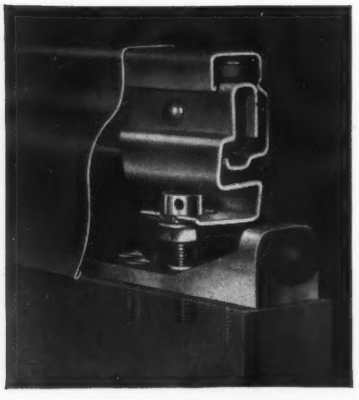

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Please write for descriptive literature and erection data.

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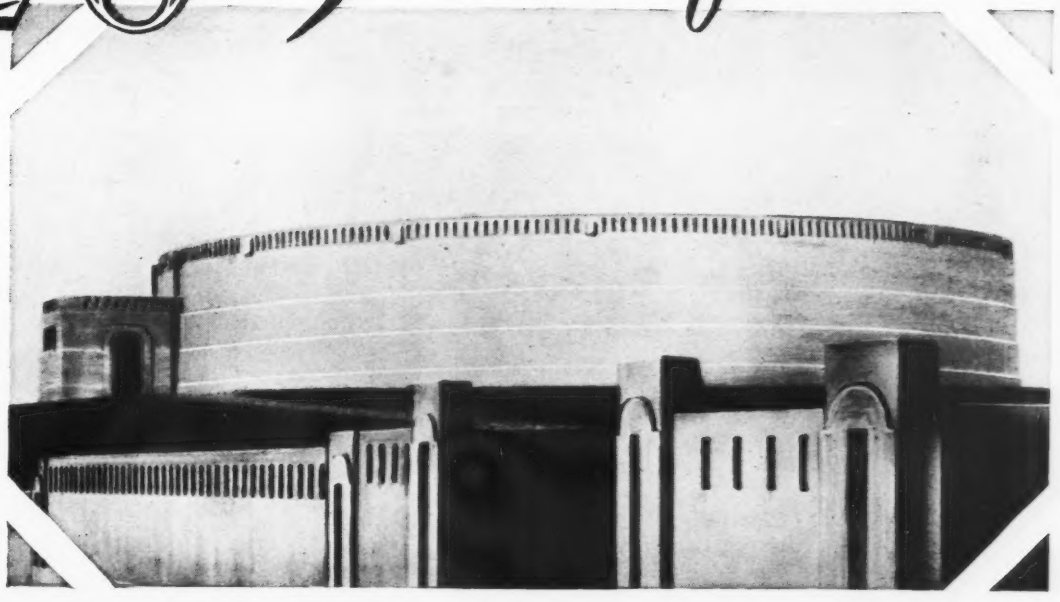

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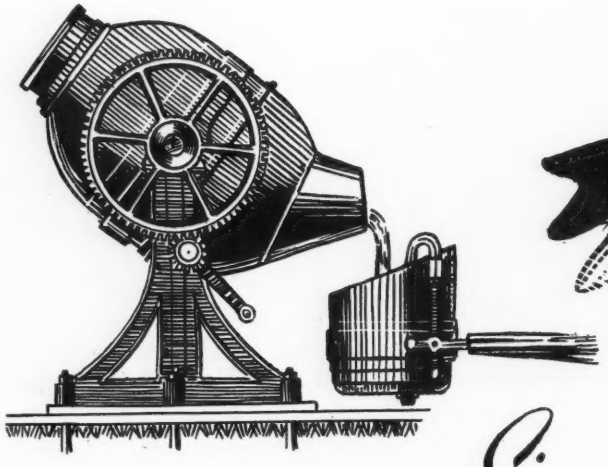

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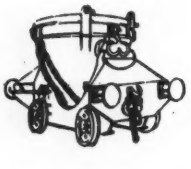

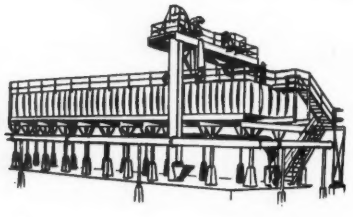

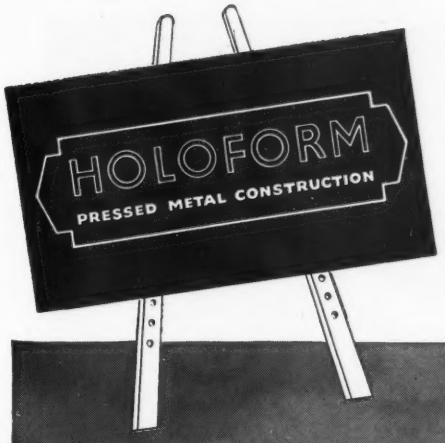

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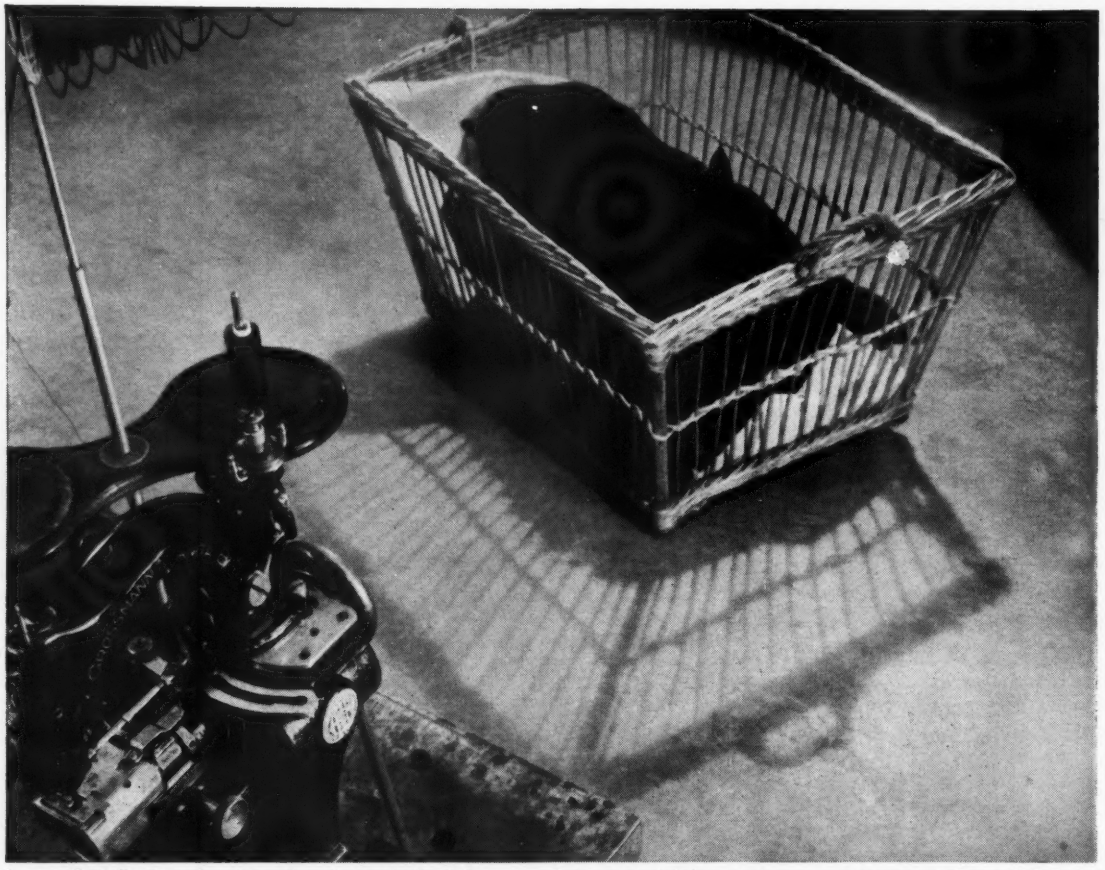

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THE ARCHITECTURAL REVIEW

Volume 110 Number 657 September 1951

The Cover Last month's issue was devoted entirely to the South Bank exhibition. But the displays connected with the Festival of Britain are not limited to the South Bank or even to London: the Festival is a nation-wide affair. Accordingly, pages 191-202 of this issue are given up to the illustration and discussion of other Festival display activities throughout the country. The photograph on the cover shows part of the Hall of Coal in the Glasgow exhibition, designed by Hulme Chadwick with sculpture by Keith Godwin. Dramatic lighting, rightness of scale, and the way in which the spectators themselves have been used as elements in the design make this a good example of exhibition technique. And the standard maintained nearly everywhere is in fact remarkably high.

150 **Frontispiece**

151 **A New Eclecticism?** *by Robin Boyd* Modern architecture the world over is divided by a new war of the styles—the Organic *versus* the Functional. What will be the outcome? Those most closely engaged naturally feel that the only possible solution is the victory of the side of their own choice; impartial critics have looked forward to a compromise in which both sides would be the gainers in certain respects. Here Robin Boyd proposes a third solution. Taking two newly built houses, both in Australia and both excellent of their kind, he examines them with a view to discovering how far their great and obvious difference of appearance may be explained in terms of the expressed aims and beliefs of the opposed stylistic camps. He reaches the conclusion that 'not one of the elements which add up to the strong visual contrast of these buildings seems to be profoundly in disagreement with the other side'—that their differences may ultimately be traced to nothing more than a difference of mood. This being so, he asks whether the choice of one side or another—Functional or Organic—need really be considered as final and binding as by most architects it now is; surely, he says, architecture can afford to allow its practitioners an occasional change of mood.

155 **Flats at Harlow New Town** *Architect: Frederick Gibberd*

163 **The Life of a Form: A History of the Train Shed** *by Carroll L. V. Meeks* No kind of structure gave more scope for the inventive genius of the nineteenth century than did the train shed. As a building form it was altogether new; while the need for spanning ever wider spaces (developing into a kind of megalomania towards the end of the century) favoured the exploration of new materials and methods. Here C. L. V. Meeks traces the history of the train shed, from its first use at Crown Street Station, Liverpool, in 1830, in detail. There were, he shows, four main phases in this history, corresponding to the four main stages in the life of any form as distinguished in Henri Focillon's classic work; the first, or experimental phase, marked by the transition from wood to iron construction, lasted from 1830 till 1850; the second, or classical (the phase of balance and equilibrium), from 1850 till 1860; the third (the period of refinement, in which æsthetic gains are consolidated and structural means perfected) began with St. Pancras in the 1860's and lasted into the seventies, overlapping with the fourth, marked by giganticism and multiplication of parts, which began about 1870 and ended (with the exception of a few sports such as Milan Station) at the time of the first world war. Today, Professor Meeks points out, the train shed is a thing of the past, relegated there by the low shed with a smoke slot invented by Lincoln Bush in 1904, and by the attitude that regards the concourse as of greater importance than the train area. But it has been succeeded by three lines of progeny—market halls, certain modern churches, and (most significantly) hangars.

175 **Housing Estate at Orebro, Central Sweden** *Architects: S. Backström and L. Reinius*

179 **The Missing Years of Robert Mylne** *by Christopher Gotch* Robert Mylne (1734-1811), descendant of a long line of Edinburgh masons, is now recognized as one of the most interesting architects of the second half of the eighteenth century in Britain. Yet in many respects he remains an obscure figure. In this article Christopher Gotch extracts and discusses a newly discovered collection of letters written by Mylne to his parents from France and Italy during the years 1754-9, and prints for the first time a long letter from Piranesi to Mylne written in 1760. These letters, with the light they throw on Mylne's movements, character, tastes and occupations during this early period, fill in the details of an extremely important chapter in the life of the architect.

183 **Current Architecture**

187 **Pugin at Twenty-one** *by Phoebe Stanton* A. W. Pugin's first published book was the *Contrasts* of 1837. In this article Phoebe Stanton discusses a hitherto unrecorded book of drawings made by him four years before—in 1833, when he was twenty-one. The subject of these drawings is an (imagined) fifteenth-century house for a Dean, John Skelton, in a cathedral city which is transparently Salisbury. Although on the surface they would seem to constitute nothing more than an academic exercise in archæology, they show that in fact Pugin was simply incapable of pure archæological erudition; every motif which his great knowledge of fifteenth-century architecture provided is re-created in the spirit of his personal style. And that style was fully formed by the time Pugin was twenty-one.

Miscellany

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214 **Acknowledgments**

The Authors ROBIN BOYD, architect, born Melbourne 1919. In private practice, and Lecturer in design and Australian Architectural History, University of Melbourne. Writes weekly architecture and housing column in *The Age* (Melbourne). Toured Europe in 1950. Publications include: *Victorian Modern*, and *Australian Home*, a critical history. CARROLL C. V. MEEKS, born 1907. Had both architectural and art historical training. Associated with Yale University in various capacities, academic and administrative, for twenty years. Past President, Society of Art Historians. Published articles in *Art Bulletin*, *Art Journal*, *Magazine of Art*, *Architectural Forum*, *Progressive Architecture* and *Encyclopædia Britannica*. CHRISTOPHER GOTCH, born 1923. Trained at Northern Polytechnic. Studying life of Robert Mylne for thesis and perhaps a full-length biography. Member of newly formed Contemporary Design Group. His book *Corsica* published in 1950. PHOEBE STANTON, employed on special research for Cultural Relations Office, US Embassy. Lecturer at Reed College in history of art. Came to England in 1947 and received PhD in 1950 for thesis on Pugin.

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price of the Review *The steadily increasing costs of production, especially the recent fantastic rise in the price of paper which has gone up by anything from 60 per cent. to 100 per cent. (varying with the type of paper) during the last few months, have made it necessary to increase the selling-price of* THE ARCHITECTURAL REVIEW. *As from July the price has been 5s. a copy, and the annual subscription is £2 18s. 0d. including postage. Price in USA and Canada $9 per annum.*

THE ARCHITECTURAL REVIEW

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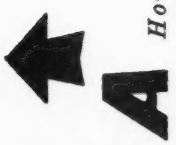
FIVE SHILLINGS

Robin Boyd

A NEW ECLECTICISM?



A House near Melbourne: architect, Roy Grounds

B House near Sydney: architect, Harry Seidler

On the opposite page are two pictures, as different as night from day, having little more in common than the photographer's viewpoint of his subject—slightly left of centre.

Although the subjects are in Australia and have some minor regional characteristics, they will be recognized instantly in any part of the world as belonging respectively to the two main opposing sides in the international Battle (II) of the Styles. Each building represents one fork of the crossroads at which twentieth century architecture, half-grown, stands today in such obvious hesitation. Greater architectural contrast could hardly be found within the narrow field of building in which both structures may be classed. A more concise illustration of the divergence of their respective schools of thought is seldom offered in practice. For the buildings are similar in size and type and were built recently under similar social and geographical conditions. The contrast is the result of nothing but the difference in artistic approach.

The difficulty, of course, is to define the difference and to find suitable sub-classifications for each building. One, undoubtedly, is Organic; but it could be also, according to recent analyses, Regionalistic, Empirical, Humanistic, Romantic, Irrational or merely Cottage Style. The other is, of course, Functional; but some may prefer Rational, Geometric, Post Cubist, Mechanistic or merely International Style. It may be best for present purposes to call the former building ***A***, the latter ***B***.

Each of these buildings is a detached house for a small family in a country which has considerable experience of detached houses for small families. The photographer has accentuated the difference. ***A*** basks beneath a clear sky in the porous shade of a great blue eucalypt. Vines have already scaled half-way up the posts of its pergola in the first warm spring. In three years the house will have withdrawn behind a veil of green and purple. Grapevine and bougainvillea doubtless will be draped in profusion above the windows and will be leaping up to cling to the projecting roof. Nature, well disciplined, will have been permitted nominally to reclaim the ground.

B has little time for its environment. It prefers the night, when nature's challenge to its independence and self-sufficiency is silenced. It will be outraged if creeper is ever allowed to interrupt its geometric precision.

Now, how many of the accepted names for the different schools of thought apply to these houses? ***A*** may be more Organic, Regionalistic and even Empirical than ***B***, but is it more Romantic or less Rational? It is often argued that direct access from living-room to outdoor living space is highly desirable in the Australian climate. The living-room floor and gravelled outdoors are level in ***A***; but ***B*** is on stilts, the better to watch a view. In the eyes of some occupants, then, ***A*** will be more rational than ***B***. In the eyes of others, ***A***'s acceptance of a module for the windows will seem less romantic than ***B***'s free pattern of window bars. Somehow the rôles seem to have become confused. ***A***, the apparent Romantic, turns out to have its feet on the ground, in both senses, rather more firmly than ***B***, with its air of businesslike utility, of a machine for looking at views.

If functionalism implies a concentration on utility and a lack of concern for niceties of proportion, then ***A***, the Organic, is more functionalist than ***B***, which should now be called Romantic Geometric. But did functionalism ever imply this, or was it always an entirely æsthetic movement?

The terms become meaningless. Seek refuge then in one interpretation which always holds: ***A*** is bound to nature; ***B*** is divorced from nature. Examine the photographs for the elements which bind one and free the other; and the more one looks, the more one discovers materials and means in common. There are in each, timber frame construction, a rectangular plan-form, living-room and bedrooms ranged behind glass walls to the best aspect, the individuality of rooms lost externally by the merging of windows, white paint, an open carport, even an external sheathing of vertical boards (though they are rough and oiled on ***A***, trim and white on ***B***).

Each expresses its frame structure, though in rather different ways. ***A*** exposes its rafters in the eaves and relishes the carpentry of the cross-frame pergola. ***B*** conceals the framing members under flush sheathing, but revels in the feeling of suspended rigidity of the frame. Each is concerned with spatial effect; living areas merging indoors and being visually extended outdoors through wall to wall glass. It goes without saying that although ***B*** succumbs more to the charm of mechanism, it was in fact erected with handcraft methods as laborious as those which formed ***A***.

The differences, then, are reduced to rather trivial details: brown oil as opposed to white paint, the shape of glass panes, and something a little more subtle: the approach to simplicity in detail. ***B*** believes that simplicity is best served by a flush sheet which conceals the complexity of the timber frame. ***A*** claims that true simplicity is achieved only when the structural means are exposed. Here is the conflict of visual against intrinsic simplicity, and scale is involved. Most subscribers to each school of thought agree to expose concrete framing; most seem to agree to conceal timber wall framing, even when function would permit sheeting on one side only. However, not one of the elements which add up to the strong visual contrast of these buildings seems to be profoundly in disagreement with the other side.

'The artist', wrote Dr. Giedion (in the 1949 edition of *Space, Time and Architecture*), 'has the right of choice [between Organic and Geometrical], of saying according to his own point of view which pleases him and which he will follow'.

The choice of each architect involved in the present comparison is understandable. ***A*** is the work of Roy Grounds, Australian born, widely travelled, with the experience of seventeen years' practice in Melbourne. During this time he has developed but has not radically altered the subdued, sympathetic character of his timber structures. ***B*** is the work of a younger man, Harry Seidler, Vienna born, some time student at Cambridge and of Breuer, Gropius, Niemeyer; a newcomer to Australia.

'. . . And which he will follow.' Giedion assumed then, as did most reviewers of the divergent schools, that the choice must be final, that the forks of this crossroads were spread so widely that there could be no bridge between them. At the best a rare genius like Alvar Aalto may have been able to pick out a narrow track, apparent to no one else, through the swamp between. It was assumed that the artistic choice was binding for life and that an architect who attempted to walk with one foot on each road, who would dream of jumping occasionally from one road to the other, was as

far beneath contempt as a nineteenth century eclectic, and as surely doomed to ridicule in the mud.

But later Dr. Giedion stated (AR Feb. '50) the need 'to leap from the rational-functional to the irrational-organic' and J. M. Richards pointed (AR March '50) to 'the logical next step, the functionalism of the particular.'

'There is,' Richards wrote, 'no call to abandon functionalism . . . but to [relate] it ever more closely to the essential particulars of time and place and purpose.'

These more recent analyses indicate the existence of a general desire to see the divergent roads draw together, to tidy up the architectural scene by rallying everyone under a common flag. In these two photographs may be detected some slight hint of the inevitable tendency to interaction between the schools. ***B***'s basement of rough stone is a positive compromise.

But although the eventual absorption of the opposing schools in a single solution is fairly certain, can we feel satisfaction at the prospect?

Here are two buildings of strong character, each confident and valid according to its lights, at opposite ends of a regrettably nameless scale of architectural quality. It seems probable that this scale will be destroyed in a natural leavening to the average.

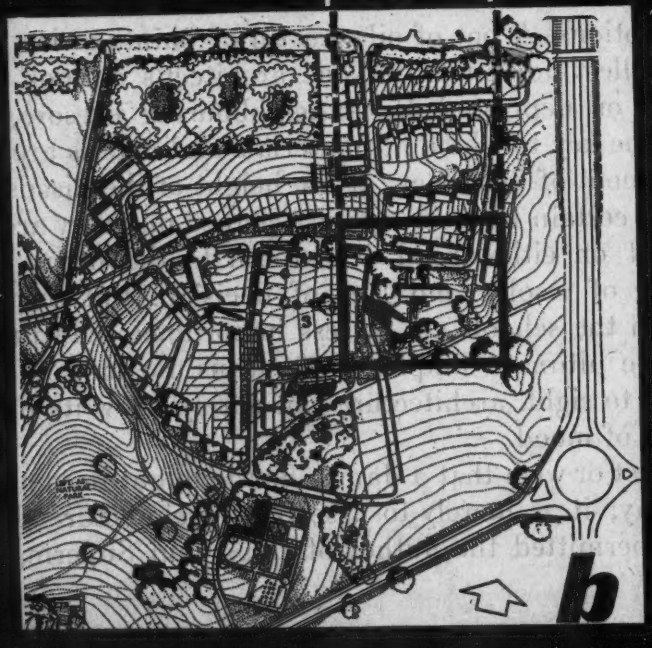
Does it indicate weakness to admit the possibility of the two roads continuing their separate ways, ever increasing the divergence and therefore the scale of architectural quality which could bridge them? Could an architect be accused justifiably of muddle-headed vacillation if he felt himself free to draw upon different parts of the scale according to the emotional impulse of the occasion? Although the buildings under discussion express the different personalities and backgrounds of their designers, is it inconceivable that two such different but competent buildings could have been produced by the one man? Might not an architect select, in a new era of vital eclecticism, the mood best suited to the time, the place and the purpose? Might not he select from the atmospheric scale whose ends are here indicated as artists in other fields determine the key or the tempo for the case?

For these buildings, and the schools they represent, are surely not as incompatible as some men suggest. No conflicting theories of any significance lie behind them, however hotly denunciative the parties on the opposing sides become at times. There is no more than the difference of mood which attended their conceptions. A pot of oil or a tin of paint; a view or a chair on the lawn: the smallest adjustment of one architect's outlook, stimulated by a fine afternoon or depressed by a neighbouring eyesore, might be sufficient to change the key to which all materials and details are tuned.

At the present moment of hesitancy, at the height of the discussion of the differences, there is a certain restraint against change on every architect who has once set his foot on either road. To switch to the other side might indicate a weakening of resolve and lack of decision. But the theoretical discrepancies between the schools are of less importance than the apparent mutual aim to achieve ultimate simplicity of means. So long as this is the aim and it is not lost to sight, architecture can surely allow its practitioners an occasional change of mood.

This is not to expect or wish that a James Barrie might become an Ernest Hemingway for a day; it is merely to assert for architecture the freedom of expression which permitted the author of 'Man and Superman' to write 'Saint Joan'.

FLATS AT HARLOW NEW TOWN



The two blocks of flats described and illustrated on this and the following pages occupy a key position in the housing area in the Mark Hall North Neighbourhood at Harlow, the most forward of the New Towns. The ten-storey tower block performs very much the same visual function in the landscape as the tower block of the Orebro housing estate illustrated on pages 174-178. But whereas the rest of the Orebro scheme is composed of a series of identical, linked 'star' blocks on a flat site, Harlow comprises a variety of housing types distributed on an irregular plan inspired by sloping contours. Numbered viewpoints in plan A above correspond to the illustrations on the following pages.

FLATS AT HARLOW NEW TOWN

FREDERICK GIBBERD: ARCHITECT R J Double: Assistant Architect

1

1, model showing the relation of the flats illustrated here to the Mark Hall North neighbourhood. 2, the tower and three-storey block seen across the park from the direction of the Epping-Bishops Stortford Road with two-storey houses to the left.

These two blocks of flats, known as The Lawn, are part of the wider design by the same architect, the Master Plan of the Mark Hall North Neighbourhood. The Lawn is situated on the eastern edge of the Neighbourhood, where it may be seen from the main Epping/Bishops Stortford Road. To avoid the usual prospect of low small house development from the road, the flats were designed in two blocks, one three storeys high, the other ten, which provide both a broken silhouette, and a contrast in mass. The tall building is not sited as an obvious focal point to the road, but is seen obliquely, first above the roofs of other dwellings, and then in its entirety through a landscape gap in the development, plan B. The two blocks are situated on high ground, and form the pivot to the design of the housing area. The three-storey block is placed behind the Tower, so that its strong horizontal lines counteract the verticality of the other building. Both buildings stand in the midst of nine large trees, and rows of terraced and

2

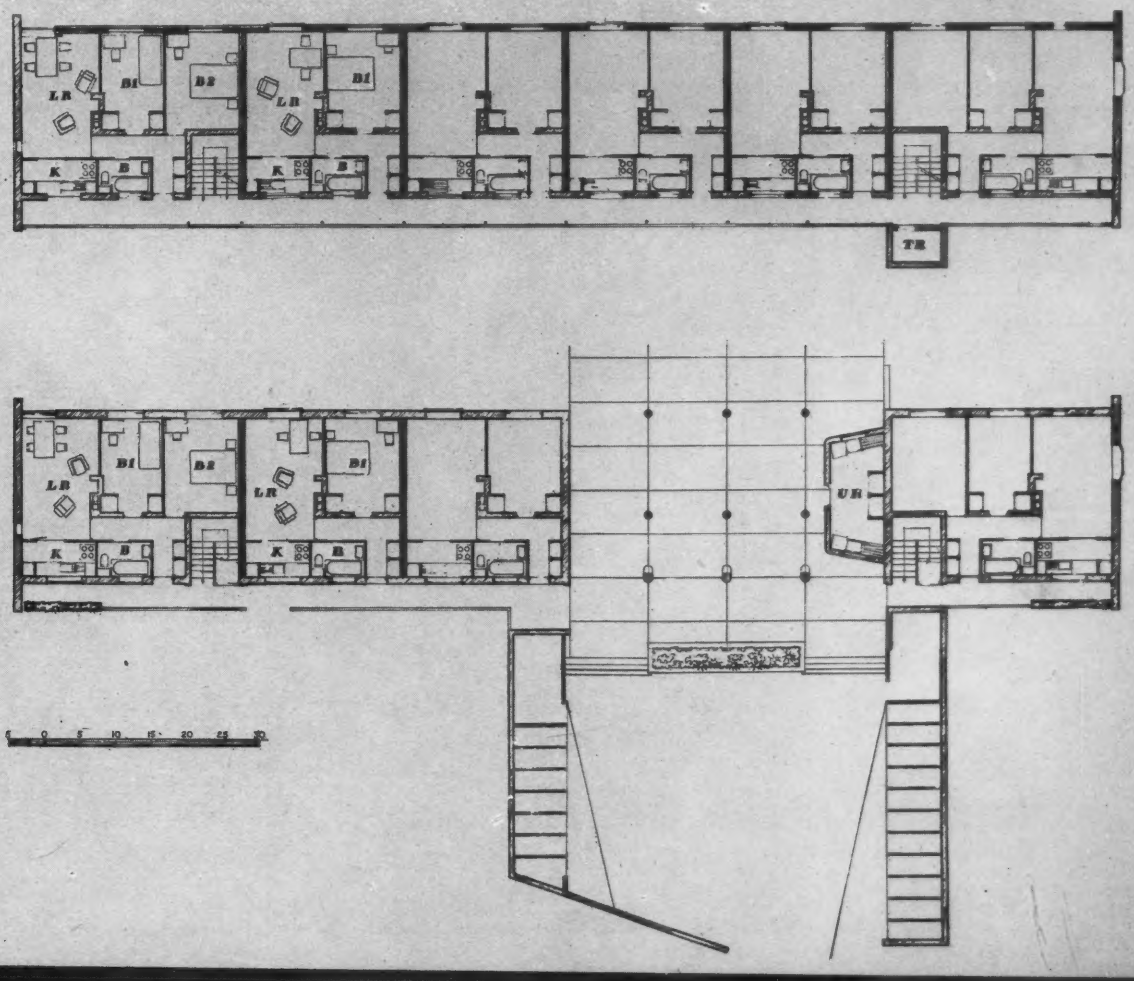
3

4

3, opposite, the south façade of the three-storey block. Brickwork is pinkish beige with dark reds and browns to end and screen walls. Windows and eaves are painted white, the tiling to laundry on the left of the columns is blue-grey. 4, opposite, the three-storey block from the south-west looking across the entrance drive of the tower block.

detached family houses with private gardens surround this central composition, plan A. The two buildings are related to each other and the site by pavings, walls, screens and planting. An entrance forecourt with storage sheds is placed on the north side of each block. The three-storey block is pierced on the ground floor, so that the paving extends under it, to link up with a terrace and garden, extending along the east side of the Tower, plan C, page 160. The Tower is not, therefore, an isolated unit of design, but forms one composition with the nine trees and the other flat block, and is itself part of the wider design of the complete housing layout.

All the flats are small, as it was felt that this form of development is ideal for single persons or very small families; accommodation for medium and large families and those requiring a private garden is provided in adjacent two-storey terrace houses. The plan of the three-storey block, below, is of the gallery type, with all the habitable rooms ranged on the opposite side of the gallery to overlook the garden to the south. The flats at each end have two bedrooms, and the intermediate ones are single bedroom type. The plan of the Tower Block, page 158, consists of four flats on each floor —two bed-sitting room and two one-bedroom flats— grouped round a lift and staircases. The plan is a butterfly shape arranged so that each living room and its balcony has a south aspect and a view over open landscape. The flat roof is designed as a roof garden, with shelter against wind and rain, from which there are magnificent views of the town and the surrounding



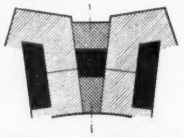
scale 1/48 in. = 1 ft.

ground and first floor plans, three-storey block

5

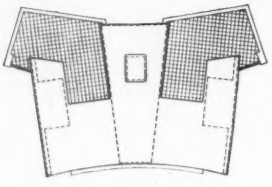
5, the tower block, showing the pattern of the brickwork obtained through the bond of two stretchers to one header with occasional projecting headers. The 'butterfly' plan allows each flat to have its living room and

key plan

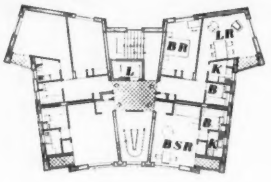


balcony facing south. Bathrooms and kitchens are planned as two sanitation units, with the central lift tower as an independent structure. 6 shows the forecourt to the tower block, and 7, opposite, the pattern of the windows in the sanitation block on the east, and the framed south façade. East walls are in warm red and brown bricks. The south façade is of concrete bricks of pale biscuit colour. Balconies are of bright blue tiles surmounted by a balustrade of sage green.

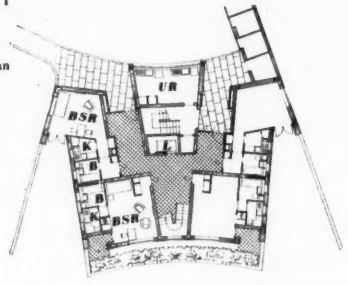
roof plan



typical floor plan



ground floor plan



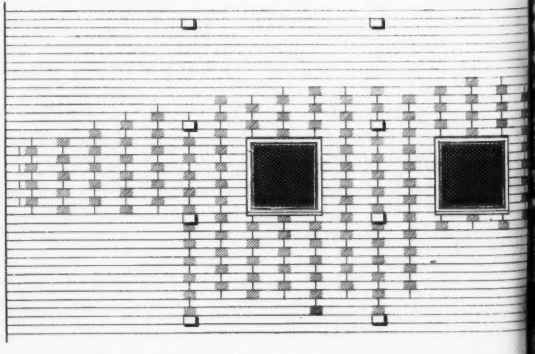
FLATS AT HARLOW NEW TOWN

countryside. The bathrooms and kitchens are placed in two 'sanitation units' on each side of the building, above which are the tank rooms; the services are thus concentrated together; the central lift tower is an independent structural unit, so that noise vibrations are not transmitted to the dwellings, key plan above.

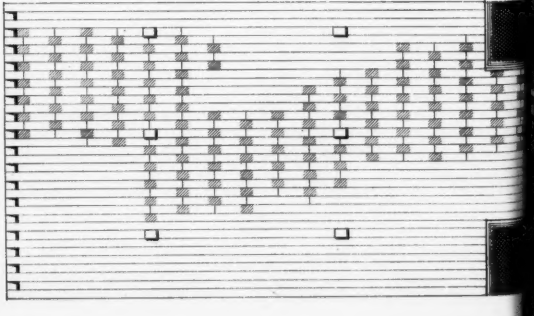
Both the buildings are faced with bricks of different kinds, which are laid to various types of bond, thus giving contrast in colour, surface pattern, and texture. The bond for every length of wall was drawn out, and room size and

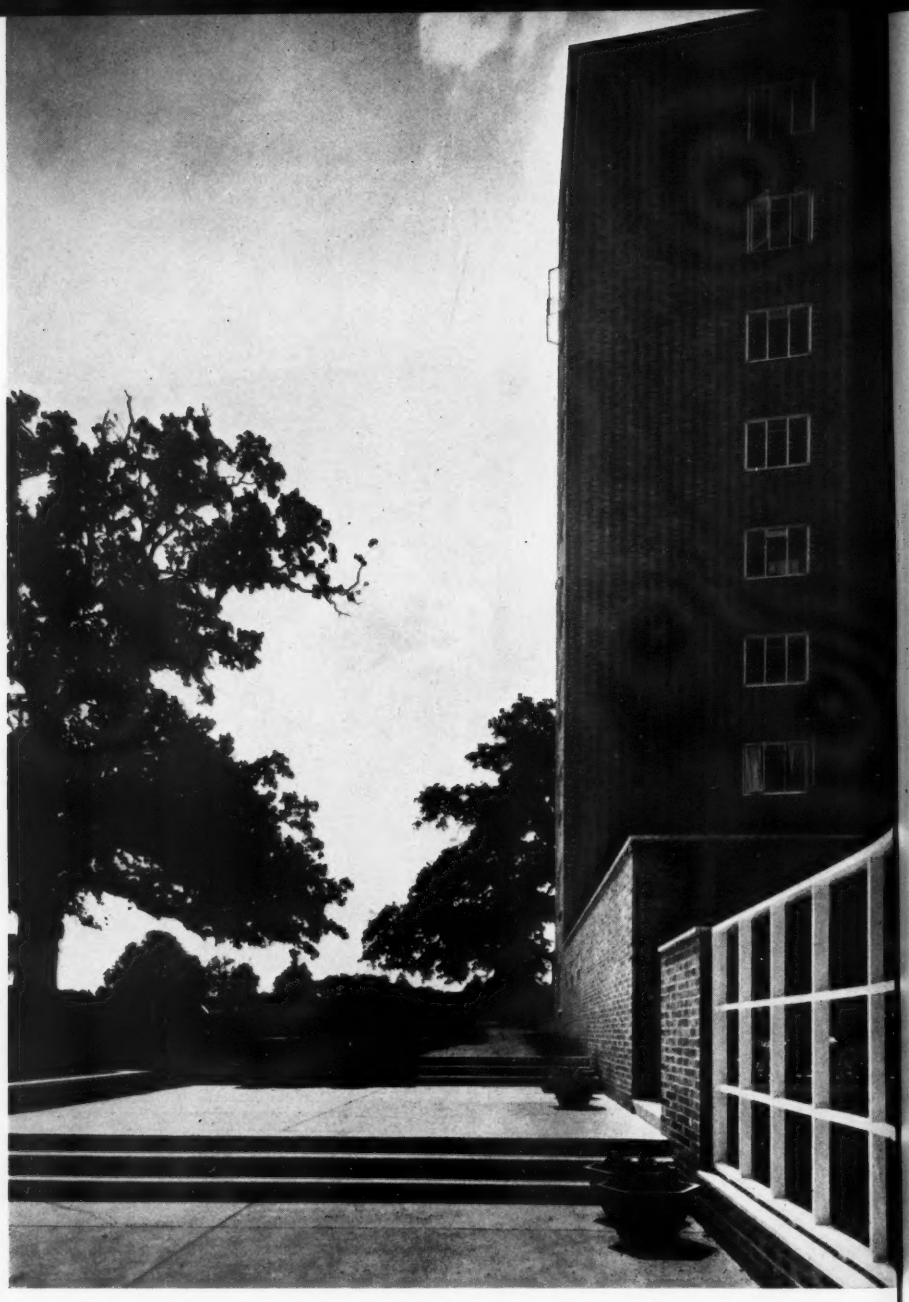
6

pattern of brick bond and windows to sanitation unit



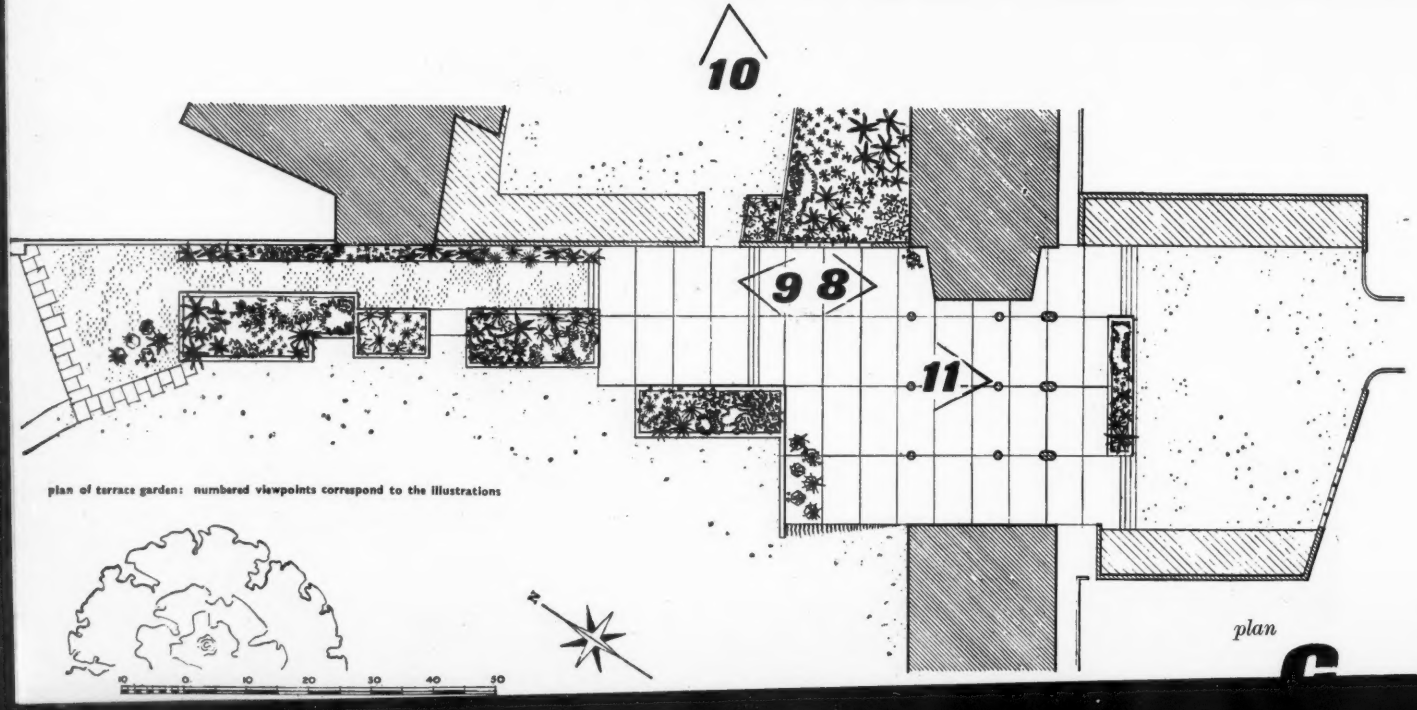
pattern of brick bond on north wall of tower block





8, the paved terrace garden linking the three - storey and tower blocks.

FLATS AT HARLOW NEW TOWN



plan of terrace garden: numbered viewpoints correspond to the illustrations

plan

window spacing adjusted to ensure that it worked over the whole of the surfaces. Exposed concrete surfaces are reduced to the minimum, eaves and similar details being faced in timber; the balconies are faced with glazed tiles, and where concrete is exposed, it is specially faced and protected by weather-stripping. The ten-storey block is constructed as follows: reinforced concrete frame with hollow tile structural floors and reinforced concrete staircases. External walls are 14 in. brickwork to full height, giving 4½ in. brickwork cover to the frame, and a flush internal surface to all the rooms. The lift well is constructed in reinforced concrete as a separate shaft, isolated from the structure, and insulated at all junctions with frame or floors, by ½ in. cork. The roof garden is paved with 12 in. × 12 in. asbestos tiles on three-layer roofing felt. The heating and hot water installation is electric, with a fixed panel fire to each living or bed-sitting room, and multipoint water heater serving bath, basin and sink.

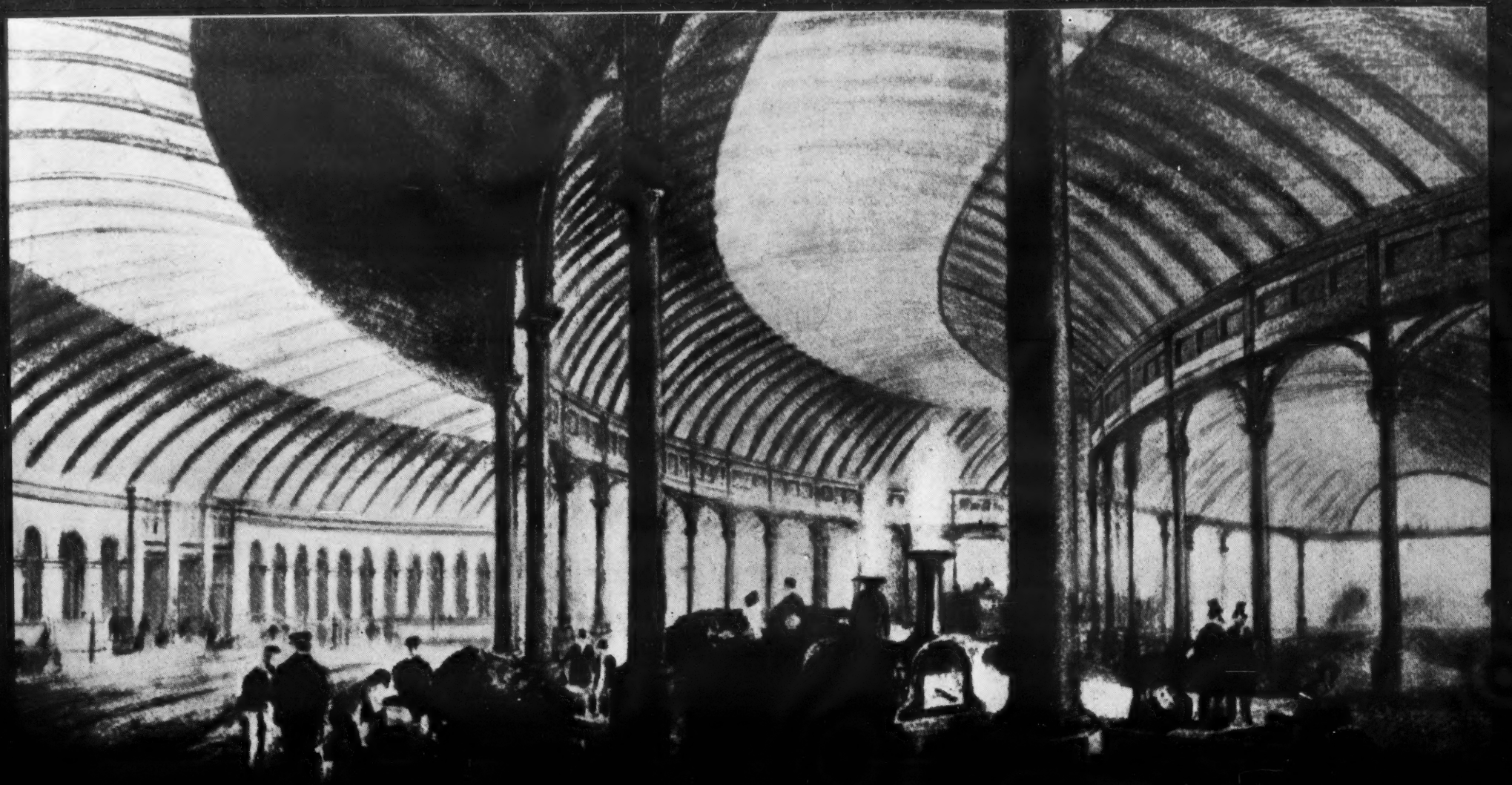
The three-storey block is constructed with load bearing walls 14 in. to first floor level, and 11 in. cavity above, with hollow tile floors and roof, and reinforced concrete staircases. The flat roof is covered with ¾ in. asphalt. Each flat is fitted with a slow combustion grate, which also provides convected air to the adjoining bedroom, and hot water by means of a back boiler. All flats have a conduit installation for a common television.

9

10

9, the forecourt which extends beneath the three-storey block. 10, the south façade of the three-storey block. The screen walls are intended as visual links between the various architectural elements. 11 is the terrace garden from beneath the three-storey block.

11



the train shed The all-embracing train shed, covering tracks and platforms under one vast unbroken roof, is, as an architectural form, now dead, although its spirit lives on in its progeny—most notably market halls and aircraft hangars. During its lifetime however (which for all practical purposes may be reckoned as having begun at Crown Street Station, Liverpool, in 1830 and ended with Lincoln Bush's invention of the smoke slot in 1904) the train shed lent itself to the production of some supremely dramatic æsthetic effects, for instance the triple vaulting of Central Station, Newcastle, 1845-50, illustrated above, in addition to playing an immensely important part in the development of new materials and techniques. Here, C. L. V. Meeks gives the first full and authoritative account of its history.

Carroll L. V. Meeks

THE LIFE OF A FORM: A HISTORY OF THE TRAIN SHED

If, as Henri Focillon once remarked, the nineteenth was the most inventive century of modern times, then the train shed can be said to typify the inventive spirit of the age. It was a peculiarly nineteenth century phenomenon. It was born in 1830 at Crown Street Station, Liverpool, and died for all vital purposes in 1904 at Hoboken when Lincoln Bush invented a less extravagant solution to the problem of sheltering passengers at terminals. In its lifetime the train shed owed its poetry and daring to the engineer as much if not more than to the architect, and its demise was also due to the engineer. In it, structural invention was clearly dominant; as in the middle ages, technical primacy led to new forms. Such a view of the importance of the train shed is not the creation of twentieth century historians looking backward, but was held by contemporary observers like the editor of the *Building News* in 1875:

'Railway termini and hotels are to the nineteenth century what monasteries and cathedrals were to the thirteenth century. They are truly the only real representative building we possess.'[1]

At the very end of the century, an American, J. R. Coolidge, Jr., was even more specific in stating that the glass cages of the great railroad stations were the characteristic architecture of the time. He admired them for their relation of structure to decoration, their amplitude without bareness, and their ornateness without confusion. Referring to a design by Normand for a terminal he says that this '. . . is our last word upon the evolution of architectural styles.'[2]

The life of any form, according to Focillon, grows out of experiments, matures into a classical phase of balance and equilibrium, which in turn gives way to a longer period of refinement, in which the elements are played with, and the structural means are thinned down and perfected, and ends in a baroque phase in which great size, vast spaces and multiplication of elements is achieved. To follow the biological symbol one step further, metamorphosis also occurs in art forms when the type, in this case the train shed, becomes transformed by new techniques and the new form-feeling, or is adapted for wholly diverse purposes such as market halls or hangars. This last phase may, of course, at the same time, be the beginning of a new cycle. The development in train sheds can be clearly indicated and suggests that the architecture of the nineteenth century may have a deeper fundamental unity, being seen as a single morphological cycle, than is generally realized.

The train shed in the first years of its development is of particular interest on two counts. Since the shed roof cannot be concealed in the way the skeleton of a building may be by masonry, the warfare between the points of view of the architect and the engineer is out in the open in much the same way as when the two professions were employed on a bridge.[3] The sort of integration which took place at Paddington in the 1850's between Brunel and Mathew Digby Wyatt was rare. In the second place the train shed as a special type of wide span construction demanded and received the best engineering skills available, and time after time pioneer engineering was done in the erection of new sheds. Innovation, the eager use of new materials and new methods of fabrication found in them a dramatic expression. There was a competitive element, too. Towards the end of the century engineers competed with one another to build wider and more daring spans. The railroad companies took pride in their colossal halls, the expense of which could only partly be justified on utilitarian grounds. The rest of the cost must have been charged off to advertising. A little later this energy went into the competition to build the highest skyscraper. Competition to build the widest single-span train shed was won in the 1890's at Philadelphia when the Pennsylvania and Reading Companies engaged the same firm to build their termini a few blocks apart.

To enclose the largest possible area of unencumbered space was an ancient dream. Until the nineteenth century each daring step was a rare and costly thing, a phenomenon not to happen again for several generations. Although it had taken centuries to achieve, by 1846 wood spans of 100 feet had become fairly commonplace, masonry spans of this width had only occurred a few times.[4] The railroad engineers quickly exploited the potentialities of iron and achieved a clear span of 212 feet at the New Street Station, Birmingham, in 1854, and at almost the same moment a triple span with the combined width

[1] *The Building News*, XXIX, 1875, p. 133. As the readers of Henry-Russell Hitchcock's recent article (*AR*, April 1951) will deduce, I am as indebted to him for valuable information and advice as he courteously implies he is to me.

[2] J. R. Coolidge, Jr., 'The Characteristic Architecture of the Nineteenth Century,' *The Architectural Review*, Boston, VII, 1900, p. 77 ff.

[3] For one point of view on this question, see J. M. Richards, 'The Wrong Turning,' *The Architectural Review*, London, vol. 105, March, 1949, p. 107.

[4] The widest vaulted span erected in the middle ages is that at Gerona of 73 feet. The nave of St. Peter's equals the widest Roman span 84 feet. The domed nave of Hagia Sophia is 107 feet and all spans which exceed this were also domed such as the Roman Pantheon, the Duomo in Florence and St. Peter's in Rome, all in the neighbourhood of 140 feet diameter.

of 238 feet at Paddington. These occurred within fifteen years from the building of the first train shed; nevertheless there were numerous intervening steps, so rapidly did the new problem call forth new solutions.

The experimental nature of the first decades of station building is shown with particular distinctness in the diversity of train shed types. The gamut extends from a total absence of any protection through an intermediate stage of cantilevered porches, marquises, pergolas, colonnades over all or part of the platform to iron vaults flung over four lines of track and two wide platforms.

The classical shed at Potsdam seemed intended more to protect the valuable locomotive than the passengers as they had to move across an open platform to get under it. At Syracuse, New York, in 1838, trains, passengers, goods and smoke were confined in the presumably frenzied compass of a single roof, a slightly ornamented temple-barn, 1. The Leipzig Station of 1837 was similar in concept but more open, 2. At Kassel the shed, while wholly detached from the much more modest station building, was an elaborate three-naved skeleton, looking a little like a church without the enclosing walls, 3. The types destined to have a future were primarily three: the relatively short-lived wood-framed ones, and the two principal ways of using metal as trusses and as arches. Each of these requires separate treatment.

At first the natural thing was to lean upon centuries of experience and construct the roof supports entirely or chiefly of wood. Stephenson's first station, Crown Street, Liverpool, was the first European building expressly designed for the purposes of a railway. It was provided with a modest wooden shed with a Queen Post truss about 35 feet wide.[5] In 1836 when the terminus was moved to a new location at Lime Street the shed was constructed in the same way but the span increased to 55 feet. The first train shed at Paddington, in 1837, a wooden King Post truss, was only 30 feet wide, 4. The next year, at Nine Elms, a wooden shed of the same type, but of larger dimensions—it covered an area of 74 by 290 feet in three spans—was erected on handsome iron columns, and using iron stiffeners, 5. The most elegant wooden constructions of the period were the sheds by Brunel at Bath and Bristol, both about 1840. Since these sheds were built upon lofty viaducts, there was an urgent reason for reducing as far as possible the thrust of the principals, hence the trusses, ostensibly hammer-beams, were constructed like cranes with iron columns, standing somewhat inconveniently at the edge of the platforms, as uprights. At Bristol the span was 72 feet, four feet more than that of Westminster Hall, 6. So, in less than a decade, a handsome, if derivative, form had been devised on what was destined to become the most dramatic element of the station complex, the setting in which nervous travellers first came in contact with the marvellous contrivance by which they were to be hurled through space. Perhaps the traditional nature of the architectural detail was intended to be reassuring. Gothic was used on the European Continent also, less grandly, at Nuremberg. The twin stations of 1840–42 at Vienna had wood trusses with iron ties spanning 33 feet. Triple spans in wood were not uncommon; in 1840, the first Thüringischer Bahnhof at Leipzig had three equal spans of the same dimension. A much more ambitious roof was constructed by English engineers at Rouen in 1842–44. The single span was 82 feet, close to that of the Basilica of Constantine. In 1846 Leoncé Reynaud's sheds at the first Gare du Nord consisted of two naves, each 56 feet wide, roofed with trusses of iron and wood which were deprecatingly referred to by the *Illustrated London News* as 'utilitarian like English ones.'[6] Wood ultimately was given up since it deteriorated rapidly, if it did not burn up first, from exposure to sulphurous steam, and had to be repaired or replaced in a decade or two.

The engineers of the London and Birmingham line used metal from the very first. Both Euston Square and Curzon Street had double sheds with Howe trusses in iron on cast-iron columns. At Euston the span was 40 feet and at Curzon Street, 'the finest in the world' in 1839, that figure was exceeded by 17 feet.[7] At Euston the original sheds may still be seen, now resting on higher supports.[8] Their glory was, however, short-lived, for the Derby Trijunct Station by Francis Thompson completed the same year had a truly splendid shed covering nine lines in three spans of which the widest and central one alone was the equal of Curzon Street's. The whole covered area 140 by 450 feet in 1843 was 'of unequalled extent.'[9] Contemporary views make the construction appear very light and elegant. The interior supports were tall cast-iron columns in the form of a bundle of ribbon-bound fasces. These may still be seen *in situ*.

Numerous sheds of much smaller span were being built at this time, chiefly remarkable because of their use of a functionally expressive kind of struts which by their greater bulk clearly showed their role as compression members. In spite of the great strides that were being made, there were occasional difficulties; the shed of the Bricklayer's Arms Station consisting of three parallel iron-roofed sheds crashed in 1844 and again in 1850. In the former year the new Victoria Station at Manchester eclipsed the Derby Trijunct. Its shed was not as wide but 250 feet longer, a remarkable increase in view of the fact that the original shed at Euston only a few years earlier was only 200 feet long. The race was already being run at a swift pace, the chief contestants being the French and the English. In 1846 Eugène Flachat built the longest span roof in the world at the Entrepot de Marais, a rigid four-centred iron arch 118 feet long. The next round was to the English who were designing one to be 152 feet. Turner and Locke assisted by William Fairbairn were boldly trying to equip the new Liverpool station, the third in fifteen years, with a shed which would not hamper the future revision of the track plans which experience had shown were frequent. They chose the sickle girder form with cast-iron struts. Although the first ribs had

[5] The appearance of this station is known from prints, one of which together with a conjectural plan was published in the *Architectural Forum*, vol. 84, February, 1946, p. 105.

[6] June 20, 1846, p. 408.

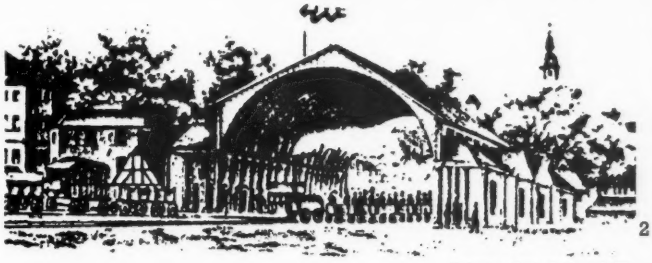
[7] Thomas Roscoe, *The London and Birmingham Railway*, London, 1839.

[8] G. R. Smith, *Old Euston*, London, 1938.

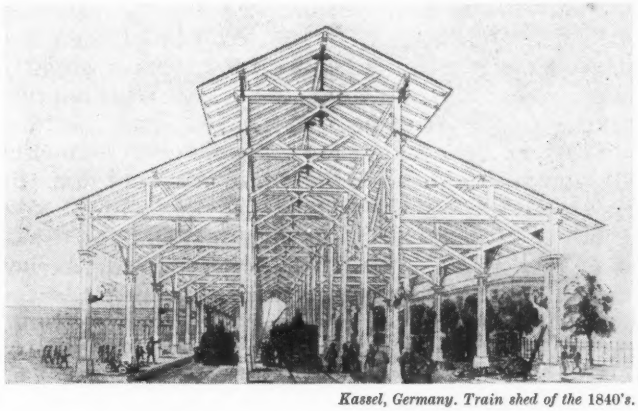
[9] *Illustrated London News*, 111, 1843, July 15, p. 35. The contemporary illustrations of this station and of the interior of the shed are reproduced in the *Architectural Forum, ibid.*

the age of experiment The train sheds of the 1830's and many of those of the 1840's were of wood or of wood and iron combined. By the later forties wood spans of a 100 ft. were not uncommon, but wood was soon to be superseded by iron and the second Lime Street Station at Liverpool (7) had the unprecedented span of 152 ft.

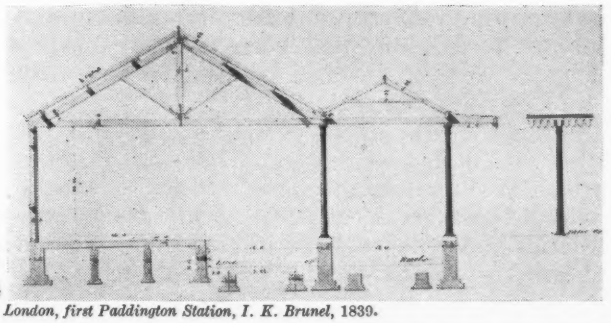
1 *Syracuse, New York, 1838-69, span 25 ft. wood.*



2 *Leipzig, first station, 1837.*

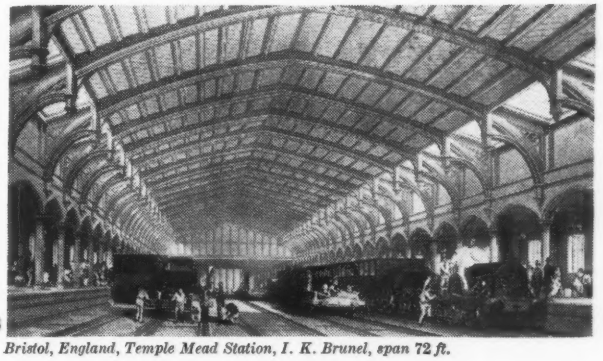


3 *Kassel, Germany. Train shed of the 1840's.*



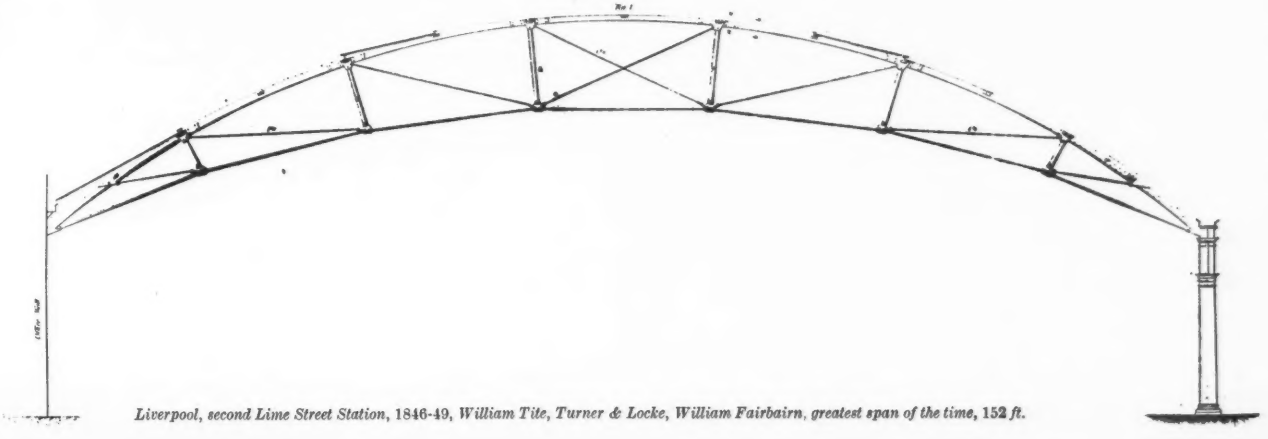
4 *London, first Paddington Station, I. K. Brunel, 1839.*

5 *London, Nine Elms Station, 1838-40, Sir Wm. Tite.*



6 *Bristol, England, Temple Mead Station, I. K. Brunel, span 72 ft.*

7



Liverpool, second Lime Street Station, 1846-49, William Tite, Turner & Locke, William Fairbairn, greatest span of the time, 152 ft.

failed when tested at the foundry in Dublin, they later succeeded in completing a shed in one span 152 feet wide and 374 feet long. Nearly complete in 1849 it was the largest span in the world, since it surpassed every earlier roof in any material including domes, 7.[10] The age of experimentation was practically at an end in Europe. Enough types had been tried in connection with various *partis* for the station itself so that a few dominant types were crystallizing out. A supply of technicians had been trained, and the next decades were to see the building of numerous stations of classical maturity.

In America the circumstances were wholly different. There had been as yet no great concentration of population in huge metropolises. Miles of rather poorly built track connected the widely separated coastal cities and reached back into the middle west. Huge terminals were hardly needed, and the available capital, much of it foreign, had to go into track, bridges and tunnels. The early stations were therefore small, poorly built, and often, like that at Syracuse, combined a small shed in the station building itself, of which it was in many cases the most considerable part. In addition to being narrow the sheds were usually low. The heavy timbers of the trusses must have seemed to bear down upon the traveller in a most oppressive manner, sooty, smoky and dark, as very little glass seems to have been used. A mitigating circumstance was that wood was burned instead of coal until the sixties. The station at Berlin is typical of hundreds built in small towns in the United States, all through the nineteenth century from stock plans, 8. The principal effort at sheltering the passengers was the overhanging roofs, not unlike those in contemporary English stations, but supported on aggressive and obstructive brackets.[11]

By 1850 the railway system everywhere had passed the experimental stage, and the station buildings and their train sheds likewise.[12] The Gare de l'Est in Paris by François Duquesney, 1847–52, may be taken as typical of the classical terminal. Its head plan, the directness and simplicity of which were admirable, the symmetrical façade with the great arched end of the train shed dominating it, was for many years the very model of a major terminal. Perdonnet regarded it as a masterpiece, 'La gare terminale des chemins de l'Est offre l'example le plus saillant de cette architecture des chemins de fer.'[13] James Fergusson, who was not easily pleased, admired it as an expression of a railroad station perfectly appropriate to its purpose.[14] Most of its features had been incorporated in the short-lived first Gare du Nord, but Duquesney gave them enduring status. His shed was the best semicircular arch in metal, 9. Its span was 100 feet wide and it was 500 feet long. It rested on lateral walls 50 feet high. Because of its lofty perch the architect insisted that the arches exert only vertical thrust, so a tied arch was constructed. The arches were the visually important members and the ties were very light. Fish belly struts were used. This splendidly conceived space is still in supplementary use today.

8, *Berlin, USA, typical nineteenth century 'vernacular' depot.*

The semicircular arch was the favoured type in the classical period. Well-known examples include the use of laminated arches in wood, as in the Crystal Palace, span 72 feet; the Alexandra Palace of 1862 with a span of 85 feet and, triumphantly, the two parallel sheds at King's Cross Station by Lewis Cubitt. Each shed was 105 feet wide and 800 feet long. In 1869-70 the original wooden arches were replaced by arched steel girders fitted into the original iron shoes. All of this group were derived from the similarly constructed bridges which preceded them, such as those at Ouseburn and Willington Dene. The Hauptbahnhof at Munich as built by Bürklein in 1847–49 followed the general scheme of the Gare de l'Est. However, its arched wooden shed had a span of only 80 feet. The arched principals flowed cleanly from one side to the other, but started at the platform level, and the spandrels were ornamented, 10. The effect was heavy and solemn, but fell far short of King's Cross in impressiveness. At Copenhagen the same scheme was followed in 1864 with a slightly greater span; the splendid old shed was happily retained as the concourse of the enlarged station. From then on the need for greater size and permanence made metal the only economical material for the purpose. It was not until the development of new methods of fabrication in our own day that the use of wooden arches for wide spans was revived. Arches of metal were already numerous in the fifties. At the Central Station in Newcastle, 1845–50, three equal spans of 60 feet were used to cover the curving tracks. The effect is still very much as it was in 1850. The tie rods are not obtrusive, one's eye follows instead the sweeping curves of the vault which gain from triplication, and the Bibienesque effect of numerous ribs and columns moving toward and away from one is a novel and delightful experience. To all this are added the associational values of the lightness and strength of the materials dramatized by noise, steam, smoke and movement (frontispiece, page 162).

The superiority, æsthetically, of the arched form is shown by a comparison of the second Paddington Station with the later Gare du Nord. The total spans are equal, but the angularity of the members is, though not oppressive, more static than Paddington's

[10] There is questionable evidence about a wooden Riding School in Moscow with a span of over 200 feet, some years previously.

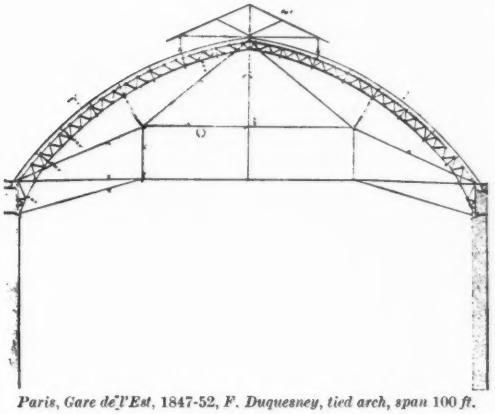
[11] See the author's 'Form Beneath Fashion,' *The Magazine of Art*, vol. 39, 1946, p. 378; and 'Some Early Depot Drawings,' *Journal of the Society of Architectural Historians*, vol. 8, 1949, p. 33.

[12] H. G. Lewin noted that the years 1845–52 constituted the second period of railway development in England (*The Railway Mania and Its Aftermath*, London, 1936). Sherrington said that the groundwork of the English railway system had been laid by 1850. Vernon Summerfield gives the terminal date of the first period of technical progress as 1850 (*English Railways*, London, 1937). Slason Thompson wrote that 'By the opening of the decade 1850, the railways of America may be said to have passed the experimental stage' (*Short History of American Railways*, Chicago, 1925).

[13] A. Perdonnet, *Traité Elementaire des Chemins de Fer*, Paris, 3rd edition, 1865, vol. 2, p. 492.

[14] James Fergusson, *History of the Modern Styles of Architecture*, London, 1862, p. 480.

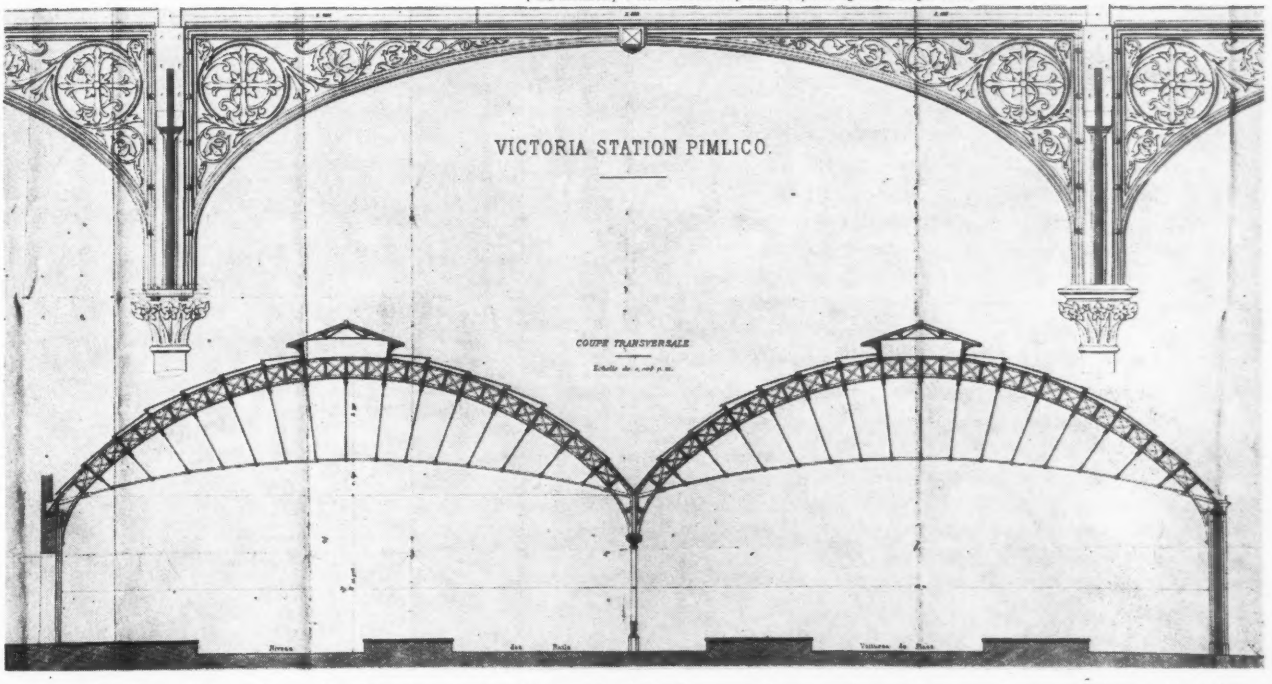
the classical age The train sheds of the first twenty years of station building were even more diverse in form than in structural system. But by 1850 this experimental phase in the life of the form was past, and architects and engineers settled down to perfect certain principal types. The semicircular arch, of which Munich had an example in wood from the end of the forties (10), was much



9 *Paris, Gare de l'Est*, 1847-52, *F. Duquesney, tied arch, span 100 ft.*

10 *Munich, Hauptbahnhof*, 1847-49, *F. Bürklein, span 80 ft., wooden arches.*

11 *London, Victoria Station*, 1859-61, *two spans 130 ft. each.*



gracefully curved ribs. Brunel and Wyatt used 189 of them, constructed of wrought iron, varying from 16 to 18 inches in depth. The web of the girders was punched out in a design of flowing curves to lighten them. Again the English showed themselves masters of spatial effects; the three naves crossed by two transepts and the generous use of glass make it the most generally admired of station sheds.[15]

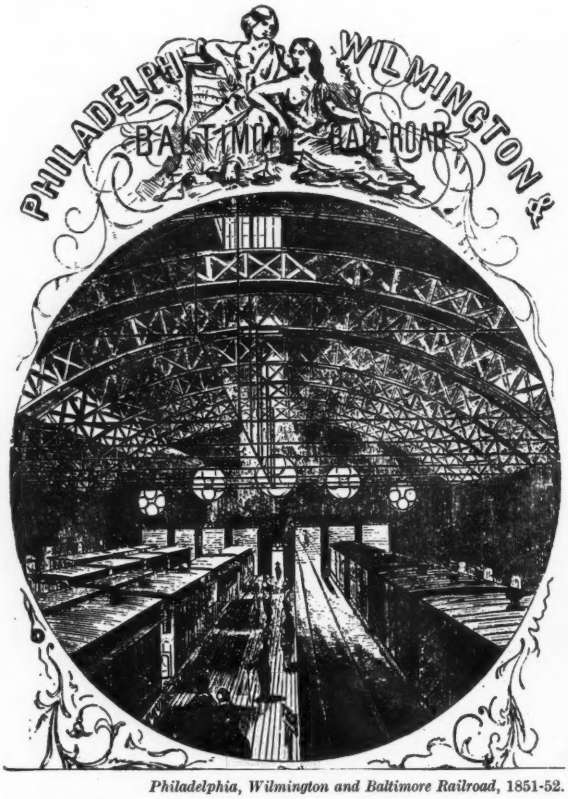
The semicircular arch was the shape most often employed at this time, but it was not the only arched form used. A sickle girder roof 211 feet at its widest point was designed by E. A. Cowper for the New Street Station of 1854 in Birmingham, and a bowstring truss was used at Fenchurch Street in London. The use of arched principals while structurally and æsthetically desirable was not economical since the curved forms obviated members of uniform size. A bent lattice girder with an arched lower chord spanning a hall 88 feet wide was adopted for the second Thüringischer Bahnhof at Leipzig. Eugène Flachat at this time built a trussed roof with a span of 131 feet for the Gare de l'Ouest. It was a technical advance, since plates and angle irons were used throughout instead of the traditional combination of plates and rods.[16] Flachat was also the designer of the sheds in the Gare St. Lazare, so often painted by Monet. Other Parisian train shed roofs were built according to the Polenceau or French system of triangles, the struts being perpendicular to the rafters rather than to the ground. These were to be found in double spans at the Gare de Lyon, 1859, the Gare d'Orleans, 1862, and in part of the roof of the second Gare du Nord, 1861-65.[17]

[15] See J. M. Richards, *op. cit.*, and Hugh Casson, *An Introduction to Victorian Architecture*, London, 1948, p. 63. Also 'Brunel and Paddington' by Henry-Russell Hitchcock, *AR*, April 1951.

[16] John Weale, *op. cit.*, plate 3, text, p. 2.

[17] René Clozier, *La Gare du Nord*, Paris, 1940, is the most recent study of this complex.

favoured during the earlier years of the classical period of train shed design. But it was by no means the only arched form used: a sickle girder roof was employed at New Street, Birmingham, in 1854, the original sheds at Victoria Station, London (11) had tied arches of elliptical form, and Fenchurch Street had a bowstring truss. From the sixties on the pointed arch, so splendidly exemplified at St. Pancras (16), became the characteristic type.



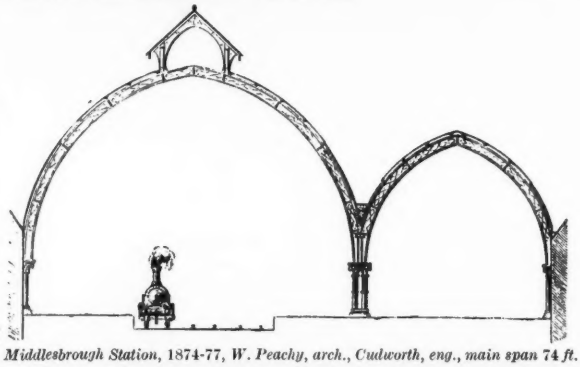
12 *Philadelphia, Wilmington and Baltimore Railroad*, 1851-52.

13 *London, Charing Cross Station*, 1862-64, *E. M. Barry, arch., J. Hawkshaw, eng., span 170 ft.*

14 *Berlin, Anhalter Bahnhof*, 1872-80, *exterior, F. Schweckton, arch., Wiedenfield, eng.*

15 *Berlin, Anhalter Bahnhof*, 1872-80, *interior, tied arch 200 ft. wide.*

16 *London, St. Pancras Station, W. H. Barlow*, 1865.



17 *Middlesbrough Station*, 1874-77, *W. Peachy, arch., Cudworth, eng., main span 74 ft.*

18 *Boston, Mass., Park Square Station*, 1872-74, *Peabody and Stearns, arched iron truss, 125 ft. span.*

The original sheds of Victoria Station, London, 1859–61, were in two spans of 130 feet each, 11. These were tied arches of elliptical form, remarkable for the height of the curved portions.

Grandiose plans for terminals in the United States deliberately conceived to equal European ones were formulated in the 1850's, but came to nothing until the first Grand Central Station in New York was built in 1869–70. In the meantime a few stations arose of more than average dimensions using the bowstring or truss with considerable audacity. Philadelphia in 1852 had the largest station in the United States. Its train shed, 150 by 400 feet, was roofed by tied wooden arches in the form of latticed girders, 12. A few years later, in 1856, Otto Matz, a German-born architect, built the Great Central Station in Chicago, already a notable rail centre. Its shed with a span of about 100 feet was like the Philadelphia one and may have owed something to that at Leipzig mentioned above. The Meadville, New York, station of modest dimensions, the span was only 66 feet 6 inches, was constructed according to the French system with hollow cast-iron struts perpendicular to the rafters tied by iron rods. Its somewhat rustic Gothic detail was sufficiently allusive to the people of the neighbourhood or to the company's publicity writer to provoke comparison with the glories of European cathedrals.

As a rule the train shed was not integrated into the total external design of the station. During the classical period this occurs more commonly, as we have noted in Paris at the Gare de l'Est. The arches of the sheds were also expressed visually on the principal façade of both the Gares du Nord, and on the end façade of King's Cross, but not at all at Paddington and rarely in England thereafter, since the station hotel became the façade of the whole complex. In America, as at Syracuse, the inseparable union of shed and station was more common, and in the station at Philadelphia and its lesser brothers the sweeping roof of the building followed or echoed the shape of the bowstring arch within. Fenchurch Street in London, 1854, is the earliest in Europe to express on its façade an arch of this shape.

In 1858 the engineer, Robert Jacomb Hood, in a paper devoted to the design of railroad terminals, made a number of suggestions which fell upon deaf ears, although after another half century had passed, his cautionary remarks were proved correct.[18] He considered that wide spans for train sheds were unnecessary and extravagant. He said that it was a mistake to use iron sash and that it was proving too costly to maintain large areas of glass. However, the engineers and the citizens of the towns in which these impressive structures were arising were too fond of them to abandon them for mere economy.

Beginning in the 1860's with St. Pancras, the train shed reached its apogee. The enlargement and refinement of the station itself, shown in such devices as multilevel schemes and more generous and better co-ordinated circulation for vehicles, was reflected in an improvement in structural technic which exhibited itself most dramatically in the train shed roof. The characteristic form now is the pointed arch which at last freed itself of the visible ties formerly marring the majesty of its soaring curves. The cheaper, less challenging truss built of triangles was not abandoned, but it was not used in the larger, more lavish stations. The period of refinement was devoted to the gradual perfection of the pointed arch which reached its stupendous climax in the Broad Street Station in Philadelphia, 1891–93, with a span of 300 feet, 23, 24.

Meanwhile the older forms were also being improved. John Hawkshaw designed the sheds of the two city terminals of the South Eastern Railway in the 1860's; both were applications of tied arches, like those of Victoria Station of the previous decade, making use of arched lattice girders with cambered lower chords. His smaller and earlier one, Charing Cross, had a span of 170 feet, 13. The curve was sufficient to bridge the space lightly but strongly without any feeling of oppression. The contrast between the solidity of the walls and the translucent roof contributed to the air of tranquillity which is still recoverable in it. This type of shed was capable of monumental external effect, too, as in the Stettiner Bahnhof in Berlin of 1876. Its mass absorbed the train shed and clothed it decently in a restrained but expressive variant of the *Rundbogenstil*. The same theme with more intricate planning and wider span was used effectively in the slightly later Anhalter Bahnhof in the same city, 14, 15. Here Franz Schwechten designed a head station in which the porte-cochère projects forward as a beacon to the traveller. Mariana Van Renssalaer, an acute architectural critic, said that it was widely and deservedly famous, as much of a model for its decade as the Gare de l'Est had been twenty years before.[19] 15 shows the grandeur of the shed and the unity which came from using curves and glass areas on the walls as well as for the ceiling. The Amsterdam Station shed of 1863, designed by the English engineer, R. M. Ordish, was a smaller but no less skilful shed of similar refinement.

Responding to the desire for more energetic forms, as well as to new structural capacities, the pointed arch followed. The first conspicuous example was W. H. Barlow's St. Pancras shed, 243 feet wide, 100 feet high and 700 feet long, 16. The latticed ribs were tied at their base by rods nearly three inches in diameter under the platforms, leaving the profile of the ribs unbroken. This is the first great room without any distinction between walls and roof.[20]

Sir Gilbert Scott had nothing to do with the shed which was designed before he somewhat reluctantly undertook the rest of the building.[21] The harmony of the pointed elements in shed and hotel were, therefore, due not to deliberate collaboration, but to the High Victorian *Zeitgeist*. Numerous pointed arch sheds followed. That of the St. Enoch Station at

[18] 'On the arrangement and Construction of Railroad Stations,' *Minutes of the Proceedings of the Institution of Civil Engineers*, 1857–58, XVII, London, 1858.

[19] *The American Architect*, XVIII, July 25, 1885, p. 41.

[20] This is as clearly achieved in this example as in the Paris, Galerie des Machines, 1889, cited by Giedion, *Space, Time and Architecture*, Cambridge, 1941, p. 202 ff.

[21] Sir G. G. Scott, *Personal and Professional Recollections*, London, 1879, p. 271 ff. Scott's defence of his design and the reasons which led him to it are piquant. He was one of the few top-flight architects of his day to tackle the problem. His design for St. Pancras was selected over those by E. M. Barry, Owen Jones, Lockwood and Mawson, and several others. *The Builder*, XXIII, 1865, p. 896, and XXIV, pp. 33, 105.

Glasgow, also for the Midland Railroad, and the distinguished one at the Middlesbrough Station by William Peachy opened in 1877, 17. The main shed was 74 feet wide and 60 feet high, and the smaller shed abutting it was 43 feet wide. The proportions of the main shed are the most vertical of the age, the ratio of width to height being 5 to 4. The most admirable examples of a movement are not necessarily the largest: so one may call the Middlesbrough Station the 'Ste. Chapelle' of nineteenth century stations. The Park Square Station in Boston, 18, of 1872–74, was a version of St. Pancras. Its smaller shed was 125 feet wide. Its structural members were much lighter and the effect correspondingly more delicate. Justin Winsor, the testy librarian, declared that this station would make a better library than most library buildings, the shed being ideal for the purposes of stack room. For a decade other American stations emulated Park Station, although not all ran to train sheds.

The fourth period of the development of the train shed may be said to begin in the 1870's and to end, except for sports, about the time of the first world war. Two principles characterize them: giganticism and multiplication of parts. The York Station, 1871–77, is of the latter type, 19. Following upon the precedent of Newcastle Central Station the wrought-iron arches are disposed in multiple concentric sheds, of which the widest is 81 feet. The arches without ties recall those of Paddington. There is a sophistication and dynamic power in the integration of these two partis which recalls seventeenth century Italian spatial manipulation. The Hauptbahnhof at Frankfurt-am-Main of 1879–88 carries the development one step further. The need for still huger stations, which was partly military, and the tendency to combine the scattered separate stations of a town into one great structure gave G. P. H. Eggert an opportunity in which he exulted. Until World War II, it was one of the outstanding stations of the world. The exterior though marred to modern taste by an abundance of ornament, nevertheless clearly expressed its function. The great window of the concourse picked up the theme set by the arched ends of the triple train shed, each span of which was 183 feet and 800 feet long. It eclipsed all its predecessors. Each unit was supported on steel arches 93 feet high tapering toward the floor and to the apex in points so fine as to be hardly visible. The cross platform, 50 feet wide, appeared to move through the ends of the sheds, and the domed concourse added another theme to the symphony. No cathedral was more structurally expressive nor more spectacularly calculated to exploit the properties of its material and the possibilities of modulated illumination. Unity was supplied by the repetition of arched glass vaults, and variety by the ascending heights and crossing axes of the five main spaces, 20.

The stations of the Stadtbahn in Berlin offer the most marked contrast to the romantic Swiss Chalets precariously poised on the New York Elevated. The monumental metal and glass sheds of Berlin, often standing in the centre of a roadway, were visible from all sides. The entrances, ticket offices, etc., were at the street level under the viaduct, the shed soared above. The Friedrichstrasse Bahnhof was typical; span of about 120 feet, height of 60 feet and 500 feet in length, 21. The ribs tapered on the exterior so that the interior was a perfect semicircle. There was a good deal of rather coarse detail but not enough to mar the sweep of the three-hinged arches. Also of this type were the Cologne and Dresden stations begun about 1890. In both, enormous central sheds were accompanied by smaller ones, complicating and enhancing the effect of the main one, which at Cologne was 209 feet wide and over 800 feet long. The lofty effect of St. Pancras shed was thus modulated into one of extension.

The series of ever-wider spans, erected at this time in the United States, culminated in the climactic ones in Philadelphia, both built by Wilson Brothers and Company. The Reading Railroad began its new terminal in 1891, 22. Like the European ones, built on a viaduct, its span is 253 feet wide, 83 feet high and 506 feet long. Following English precedent, an hotel obscures the shed from the front, but it is visible from the rear. It is a three-hinged tied arch, catenary in shape, the pins are three inches in diameter, and the tie bar is an 'I' beam under the rails.

The following year, a few blocks away, on Broad Street, the Pennsylvania Railroad, apparently determined to lead the pack, began the enlargement of its recently built station, and constructed the largest single span train shed ever to be built, 23, 24. The company evidently favoured huge sheds and lavished their resources on them. They built two others at about the same time at Jersey City and Pittsburgh, both with spans over 250 feet wide, and only a decade later began their extravagant station in New York City. The ratio of width to height at Broad Street was about 3 to 1, also a catenary. It stood until 1923 when it succumbed to the flames. Such masterpieces are rarely rebuilt. Stations with a still larger track and platform area entirely enclosed continued to be built, but never with the magnificent audacity of this one. Both the St. Louis Union Station, and the South Station, Boston, of the nineties, held the title of 'largest station in the world' for a few years. The former has a measure of vitality, the latter was inert, and has been more drastically altered. The covered area at St. Louis was 601 feet wide divided into five low spans of which the widest is 142 feet. At Boston the total width was somewhat smaller, but it was divided into only three spans, the central one 245 feet and the lateral ones 165 feet. The shed had to be removed in 1930-31.

Three examples of European train sheds built near the close of the final period of shed building remain for attention. Marylebone, London, utilitarian rather than audacious in its engineering, by its lightness and lack of insistence meriting the title 'most restful and appealing of the London termini,' 25.[22]

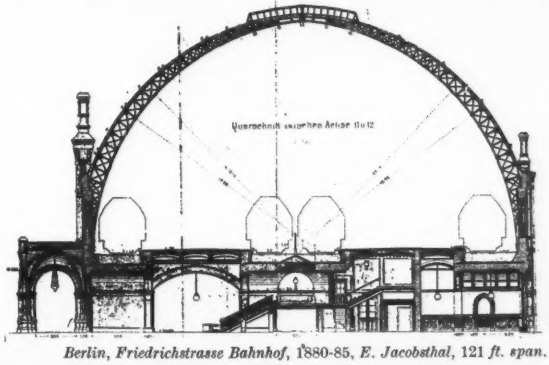
The second is equally unpretentious. The Princes Street Station in Edinburgh, with a maximum span of 182 feet built on a curved plan and with a spidery rhythmical truss system, under certain conditions can be very attractive. The third, the Hauptbahnhof at Hamburg, even in ruins remains one of the

[22] Edmund Crispin, *Sudden Vengeance*, London, 1950, p. 163.

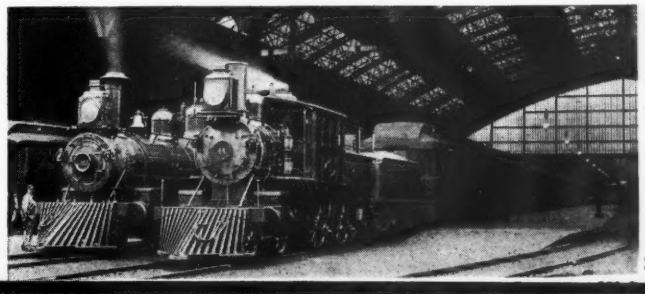
giganticism and multiplication In the thirty years following 1875 the competitive spirit that was later to find vent in the building of skyscrapers spent itself in the production of ever bigger (though not necessarily better) train sheds. Thus the Reading Terminal at Philadelphia (22), with a span of 253 ft., was quickly followed by one designed by the same architects and engineers for the Pennsylvania Railroad (23), with the unequalled span of 300 ft.

19 *York, second station, 1871-77, by T. Prosser, B. Burlay and W. Peachy, wrought iron arches, widest span 81 ft.*

20 *Frankfort-am-Main, Hauptbahnhof, 1879-88, J. P. H. Eggert, three arched spans 183 ft. each.*



21 *Berlin, Friedrichstrasse Bahnhof, 1880-85, E. Jacobsthal, 121 ft. span.*



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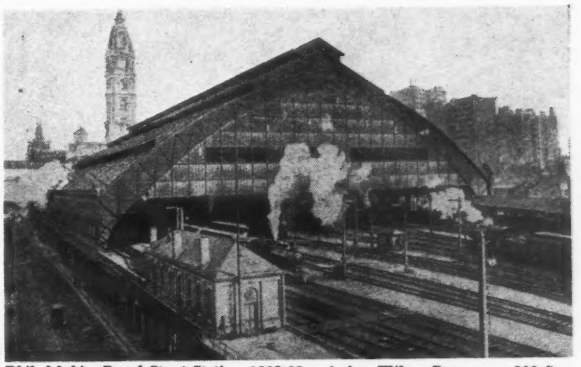
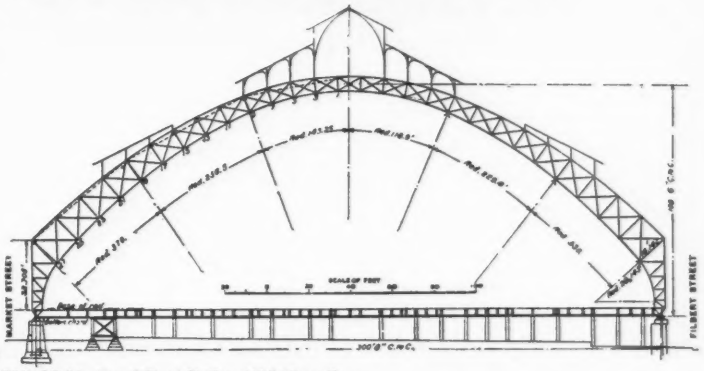
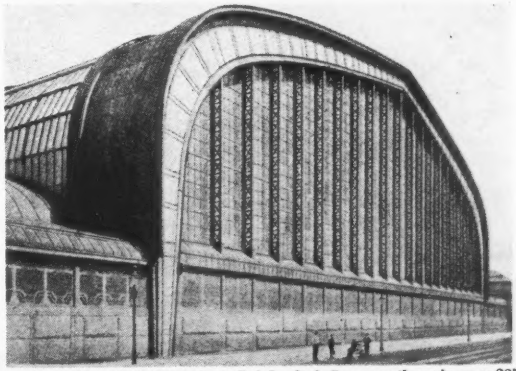


23 *Philadelphia, Broad Street Station, 1892-93, exterior, Wilson Bros., span 300 ft.*



24 *Philadelphia, Broad Street Station, 1892-93, section.*

25 *London, Marylebone Station, 1899.*



26 *Hamburg, Hauptbahnhof, 1903-6, Reinhardt & Suessenguth, main span 237 ft.*

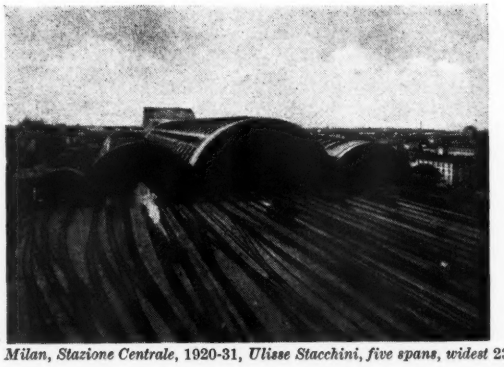
demise of the train shed The death-warrant of the great train shed was signed by Lincoln Bush when he put his name, as engineer, to the design of the Hoboken Terminal of the Delaware Lackawanna and Western Railroad (27). For this incorporated for the first time his new smoke slot, which made possible a cheaper form of enclosure for trains and their passengers.

27 *Hoboken, New Jersey, Delaware Lackawanna and Western R.R. Terminal,* 1904-6, *K. Murchison, arch., L. Bush, eng.*

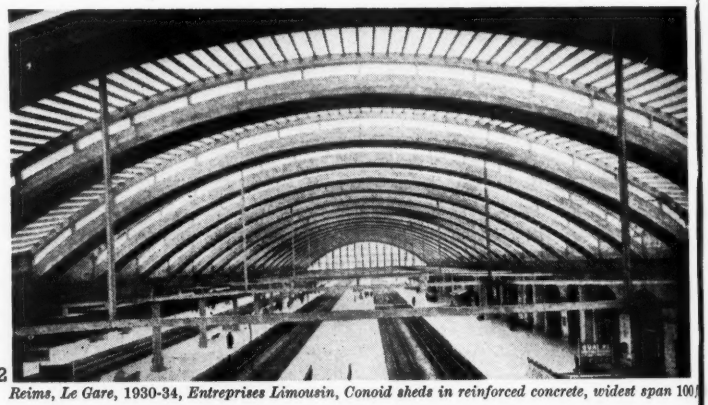
28 *Pennsylvania Station, New York,* 1906-10, *McKim, Meade and White.*

29 *Birmingham, Snow Hill, Station.*

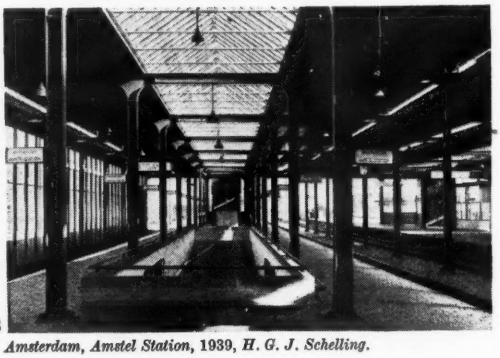
30 *Leipzig, Hauptbahnhof, designed* 1907, *completed* 1915. *W. Lossow and M. Kuehne, archs., L. Eilers, eng., six main spans,* 146 *ft. wide each, and two minor ones* 45 *ft. wide.*



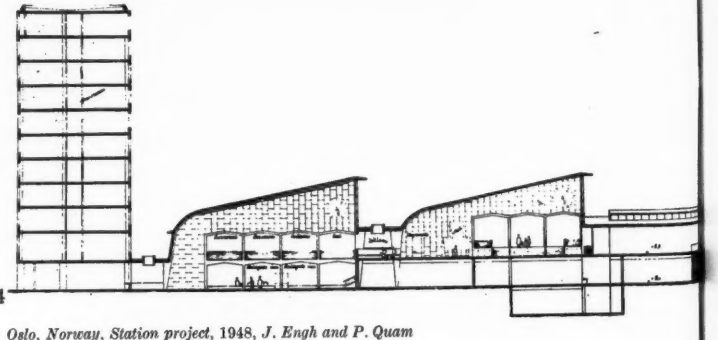
31 *Milan, Stazione Centrale,* 1920-31, *Ulisse Stacchini, five spans, widest* 236 *ft.*



32 *Reims, Le Gare,* 1930-34, *Entreprises Limousin, Conoid sheds in reinforced concrete, widest span* 100



33 *Amsterdam, Amstel Station,* 1939, *H. G. J. Schelling.*



34 *Oslo, Norway, Station project,* 1948, *J. Engh and P. Quam*

best. Its shape as defined by an alternation between rigid arches and trusses was pleasant, and the sweeping extent of its glass gave it an unusually festive air, 26.

There were two basic reasons, aside from the high cost of maintenance, for the demise of the train shed. In 1904 Lincoln Bush invented a type of low shed spanning two tracks named in his honour and applied for the first time at the Delaware, Lackawanna and Western Station at Hoboken, 27. The essential feature was a smoke slot through the roof over the centre of each track permitting the smoke and fumes to escape. At the same time the slot is narrow enough and its sides deep enough to exclude rain and snow. The vaults are constructed of concrete and the columns and ribs of metal. Later examples were built entirely of concrete. The repetition of the low vaults and the numerous columns make a not unpleasing effect, but lack the majesty of earlier conceptions. The other reason was the development of a new type of plan for huge urban terminals such as Grand Central in New York in which the tracks lay below the surface of the ground and being electrically operated permitted the station to be built over them, a saving in area of ground used, a simplification of circulation, and eliminating sheds or platform covers.

The tradition of the train shed died hard. For example the Pennsylvania Station in New York, 1906–10, in addition to its huge concourse, had a second train concourse covered by a confection in metal and glass, similar to the original Quai d'Orsay Station in Paris. The most displeasing feature of this is the translation from stone into lattice girders of the elements of a Roman Bath, 28.

Another metamorphosis is the treatment adopted, at about the same time, at the Snow Hill Station in Birmingham, where the platforms and tracks are bridged by trusses roofed over the platforms open over the tracks. Here the span is comparable with that of a great shed, yet the form suggests merely platform covers of an exaggerated extent, an effect more strange than pleasing, 29.

The vast Leipzig station of 1907–15 was the final expiring gasp of the form, 30. Multiplication was the theme and a total of eight spans were constructed, the six main ones being 145 feet wide each and the two minor ones 45 feet. These extended at right angles from a vaulted cross platform and were approached up colossal staircases through an immense masonry forebuilding. The giganticism of this was echoed, a few years later, at Milan, in the Stazione Centrale to which an enormous shed composed of five parts was attached, 31. Hinged steel arches were used and the widest span was the size so common in the late nineteenth century, about 250 feet. It is significant that the equally ambitious station now nearly complete in Rome has no sheds. The form was really extinct before the building of the Milan station. The story of the sheds at Reims, 1930–34, illustrates this. It is said that the officials of the French Railway system had not wished to rebuild the sheds after their destruction in the first world war, but that the citizens of Reims vociferously demanded their restoration. The association of the train shed with the stations of great metropolises was strong, the people evidently felt that the city would be reduced in status if sheds were lacking. Since the sheds were 'a must,' they were at the same time an opportunity and a new system was devised, 32. Conoid vaults in reinforced concrete with very light ties and low altitude were designed. The spans of 100 feet are not astounding, but the sheds remain the largest to be built in concrete. Troughs alternate with wider glazed sections, the sides of the troughs are open to permit ventilation and can also be used by window-washers, thus ingeniously solving two of the drawbacks of the older type of sheds: the tendency for fouled air to collect under the roof and the elaborate provisions necessary to permit access by window-washers to the inside of the glass areas. Just as the train shed became to all practical purposes obsolete, electrification of railways became more common.[23] With electrification sheds became practical again, the desirable protective and architectural features were theoretically reconciled, but unrealized.

The Amstel Station in Amsterdam, of 1939, on a viaduct, has neatly if not dramatically, preserved the idea of enclosure, 33. The problems here were not of course those of the huge terminal. Similarly at Newark, New Jersey, a few years earlier, under identical circumstances the idea of sheds of modest dimensions was retained on an electrified railway. At Amstel the more generous use of glass and the lighter weight of the structural members are more in tune with twentieth century æsthetics than the more ponderous handling at Newark.

The twentieth century as a whole has resorted to platform covers, which do not adequately protect passengers or crews as blowing snow and rain permeates every part of the platform. There are a few examples of well-designed platform covers, though they are infrequent. The potential grace of metal and glass or concrete canopies such as the bus shelters in Zurich and Stockholm, seems to have, on the whole, not interested railway engineers.

Few large urban stations have been designed in recent years; that at Oslo is one of them, 34. It is clear that the attention formerly devoted to train sheds has been diverted to concourses and that the train area itself is regarded as secondary. However, while people continue to have the traditional experience with great sheds, an appeal which is many-faceted, a certain nostalgia for them will survive as suggested by Saul Steinberg in some of his drawings.

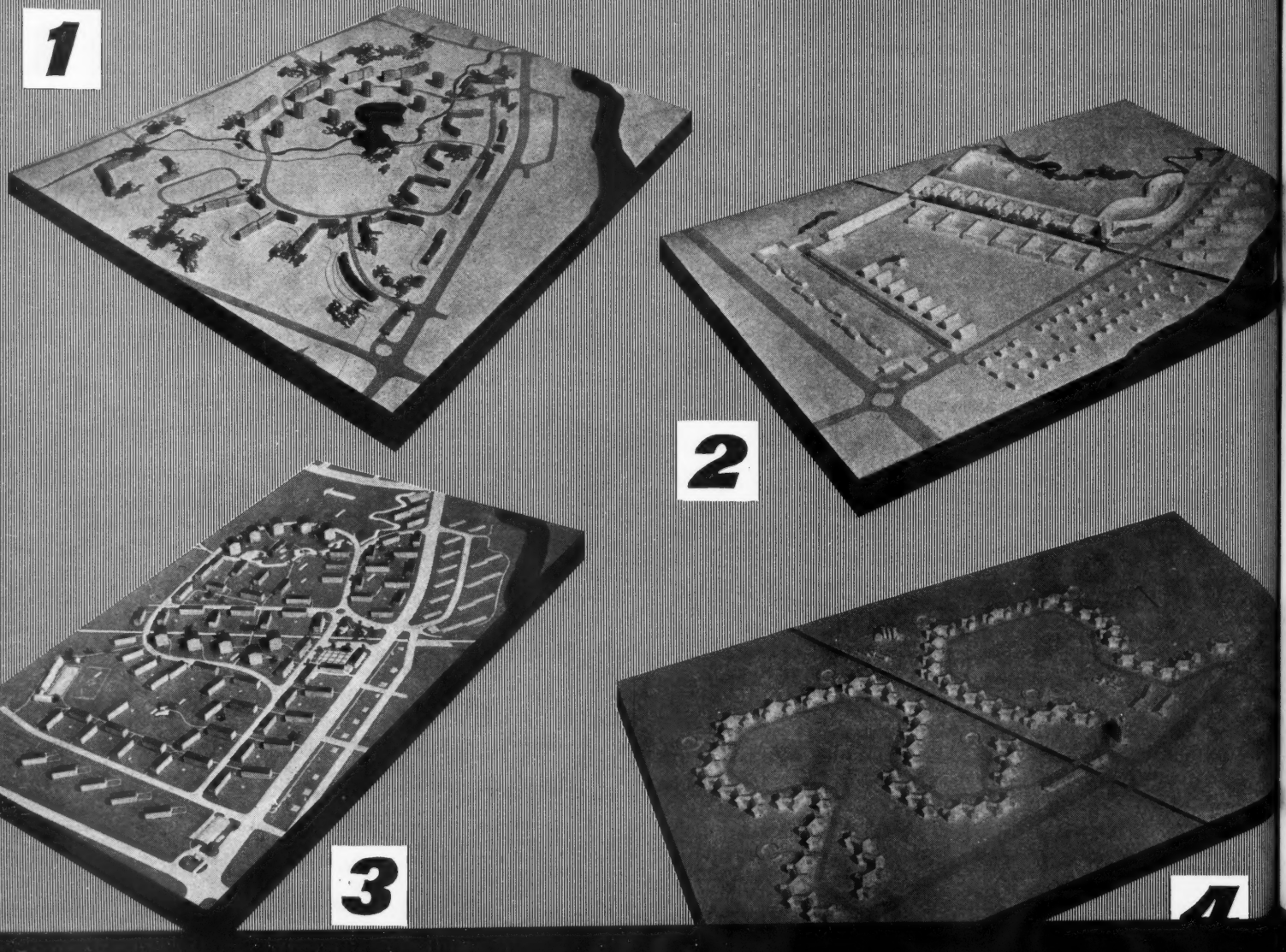
The life of the train shed as a form including its metamorphoses has been outlined. The train shed was originally the most prolific member of a genus which included conservatories, exhibition halls and market halls. Now we find that it is apparently incapable of reproducing itself for its own purpose, and has been followed by three lines of progeny, market halls which have surpassed the size of the parent, some modern churches, a dwarfed line, and hangars, most promising as well as most suitable, since they too are related to transportation. These appear to be developing a cycle of their own, having recently passed through a phase of laminated wood such as we saw in train sheds like King's Cross a century ago.

[23] It is noteworthy that none of the recognized leaders of contemporary architecture has tackled the station or train shed problem; not Wright, Gropius, Le Corbusier nor Mies van der Rohe have had this opportunity.

HOUSING ESTATE

The Rosta Housing Estate lies on the western outskirts of Orebro in central Sweden, the main industrial part of the country. Orebro itself is the centre of the shoe-making industry and has 65,000 inhabitants. Its densely populated centre which dates back to the Middle Ages is surrounded by garden suburbs of which the Rosta estate, lying on the River Svartan, is part. This estate, illustrated on the following pages and in 4 below, was the winning design in a city planning competition held in 1947. 1, 2 and 3 are models of other projects entered for the competition. This one by Backström and Reinius affords an interesting comparison with the Mark Hall North neighbourhood of Harlow New Town by Frederick Gibberd, a model of which is illustrated on p. 155. Both have tower blocks of flats for single people sited as eye-catchers for those passing by on the main road, and each tower is based on a version of the 'butterfly' plan. Here the resemblance ends; for where the three-storey star plan blocks in the Swedish scheme are formally grouped on a flat site round two parks, in the smaller, English scheme a variety of housing types is distributed on a sloping site to an irregular plan.*

* An idea which originated in the Grondal flats at Stockholm by the same architects (AR, June '48, pp. 247-250).



OREBRO CENTRAL SWEDEN

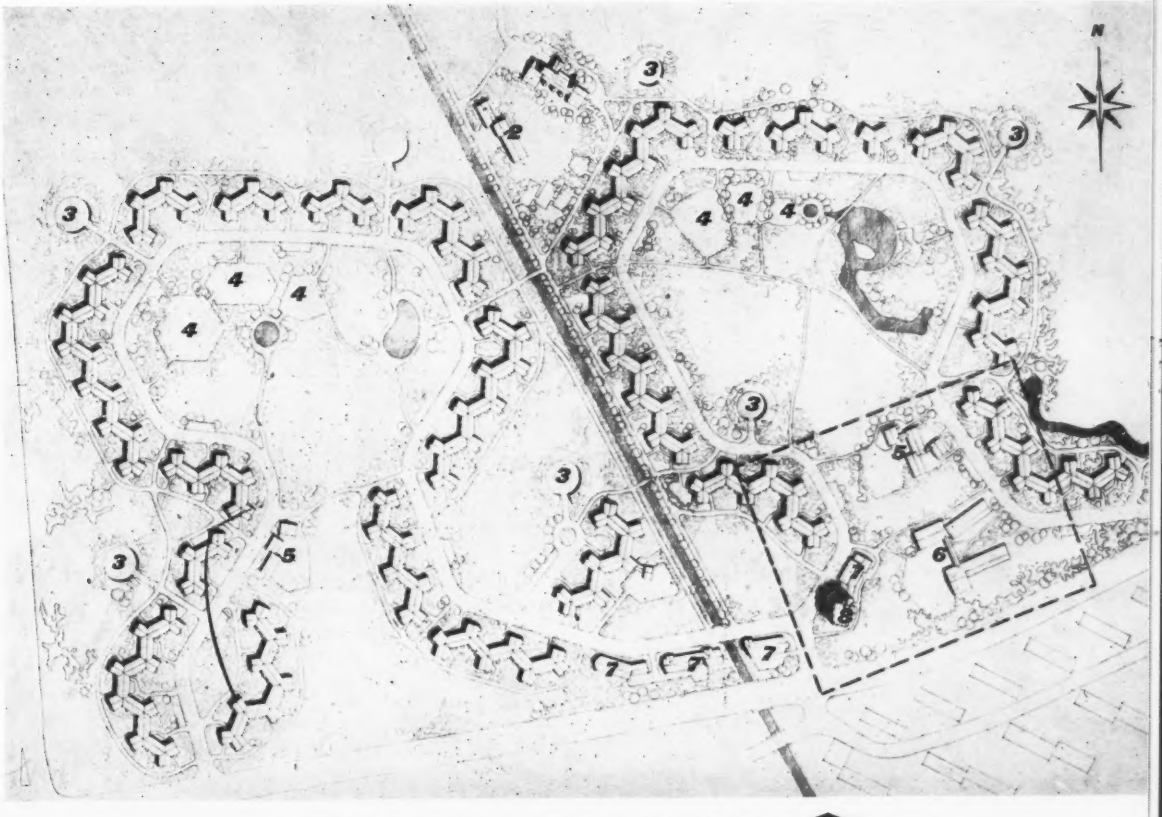
BACKSTRÖM AND REINIUS: ARCHITECTS

5, air view of Orebro town centre.

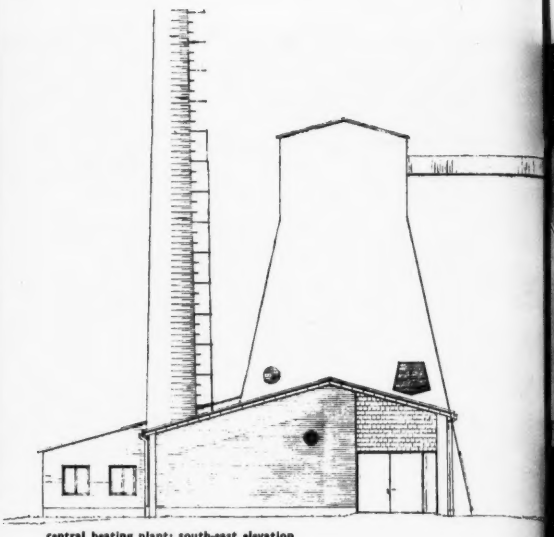
The site of the Rosta Housing Estate is flat and very exposed to the wind. The blocks are planned to provide sheltered parks which include children's play spaces. All flats are directly accessible from one main road while schools, nurseries and playgrounds are reached by pathways through the parks. Workshops are provided in the basement of each block. Shops, mainly selling food, are grouped together near the bus stop on the main road leading to Orebro. In addition milk is on sale at various points on the estate. Close to the shops are assembly rooms, a theatre, a tea shop and bakery. Nearby is an eleven storey block of flats for single people. As the local industries employ many women, care of children was an important factor in planning. Both east and west parks contain a nursery and a nursery school

key

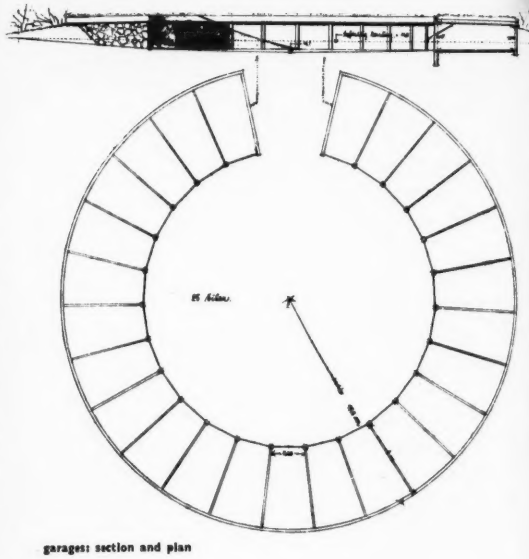
1, central heating plant. 2, communal laundry and steam bath. 3, car parks. 4, children's playgrounds. 5, day nursery. 6, primary school. 7, shops and community buildings. 8, eleven-storey blocks.



6, plan of the Rosta estate: the area enclosed in the dotted line is reproduced to a larger scale on page 176.

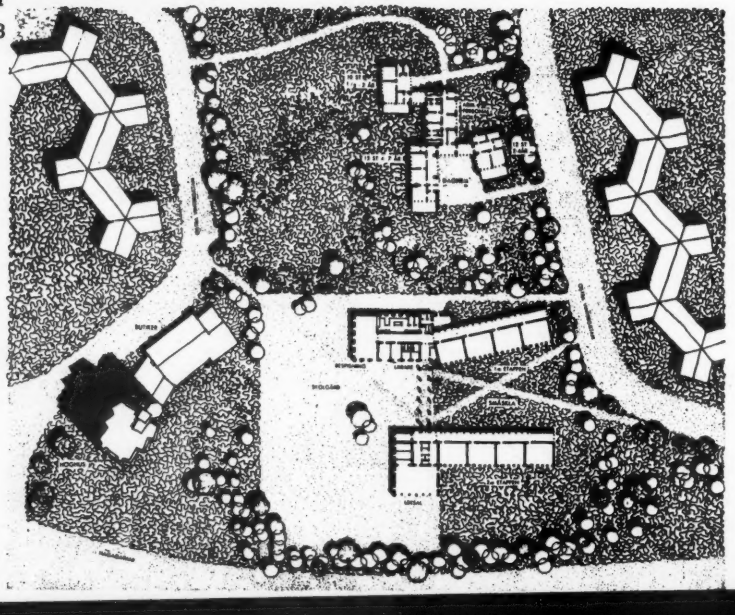


central heating plant: south-east elevation



garages: section and plan

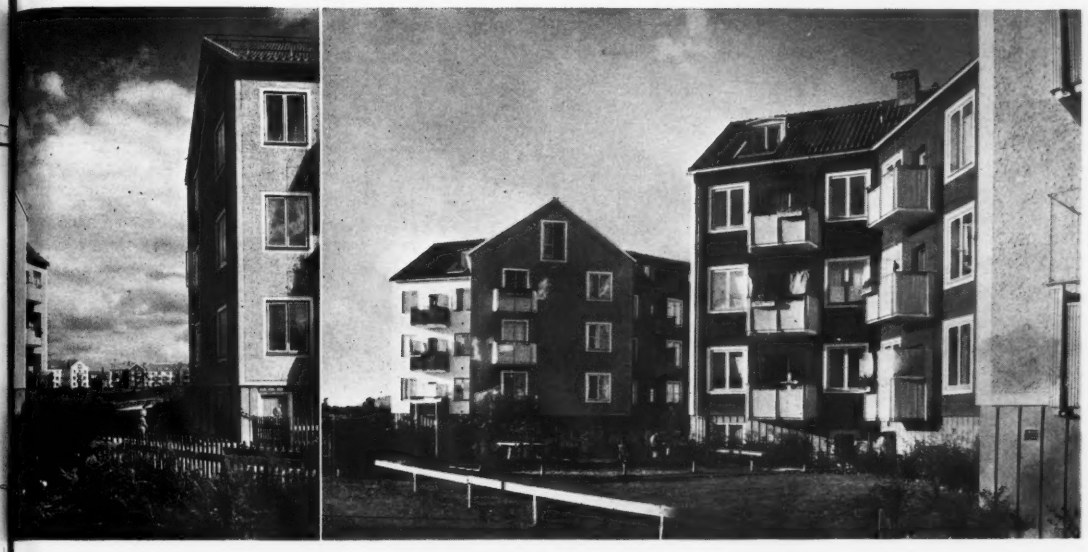
7
8



7, the eleven - storey block of single-room flats seen from the north-west, with a row of shops in the foreground. The plan, 8, shows the eleven - storey block, heavily shadowed, with the primary school to the east of it. North, between the roadways serving the three-storey flat blocks, is one of the two nursery schools.

9, looking across one of the parks enclosed by the blocks of three-storey flats which are sited to protect them from the prevailing wind. 10, three-storey blocks showing their external surfaces finished in different colours. 11, the eleven-storey block from the west.

9 10



while a primary school for the whole estate is situated in the one to the east. Central heating is operated from a plant at the northern end of the estate where there is also a communal laundry and a 'saima' steam bath. Circular garages are provided at regular intervals.

The layout of all living blocks is standardised in a star shape made up of three three-roomed flats placed all head to head and then grouped in irregular blocks to form the park boundaries. These blocks are all of three storeys. One internal staircase serves each 'star' and is lit by a skylight. The kitchens include a dining space at the window, and bathrooms have mechanical ventilation, a wash basin for children's clothes and a hot air drying cupboard.

The Rosta estate consists of 1,500 flats varying from two to six rooms and the eleven-storey block contains 66 single-room flats. The total population is 5,000 inhabitants.

HOUSING ESTATE AT OREBRO, CENTRAL SWEDEN

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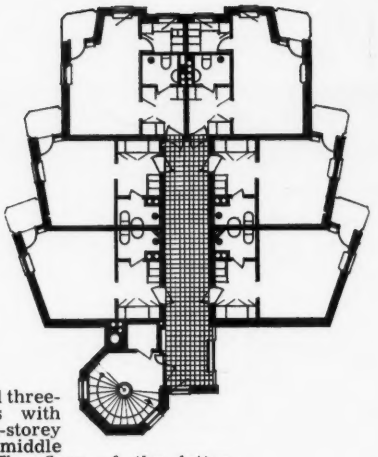
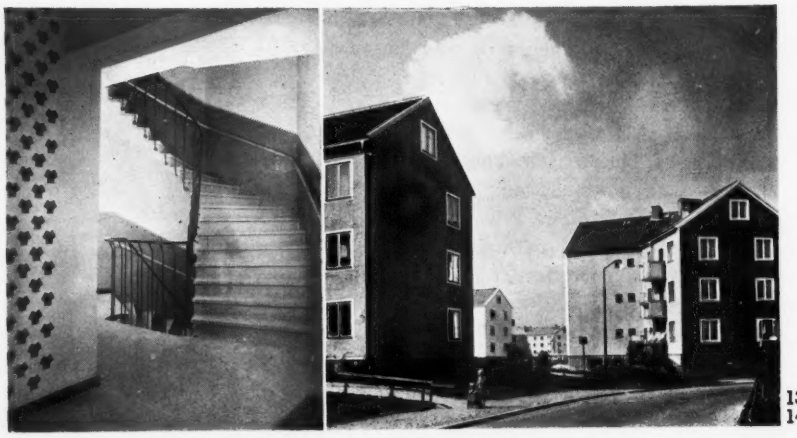


12. standard three-storey flats with the eleven-storey ones in the middle distance. The floor of the latter block at ground level is used for workshops. Above is a typical floor plan showing the single-room flats of which there are sixty-six in all.

HOUSING ESTATE AT OREBRO, CENTRAL SWEDEN

13, one of the landings of a central staircase which serves each group of three flats, the layout of which is shown in the plan below. This stairway is lit by a skylight. 14, the three-storey flats from the single main road which serves them all. 15 is the living room of a second-storey maisonette and 16 is the extra third-floor room.



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14

15
16

Christopher Gotch

1, *Portrait of Robert Mylne by George Dance.*

THE MISSING YEARS OF ROBERT MYLNE

Although Robert Mylne is now recognized as one of the most original of the later Georgian architects, he is still a somewhat obscure figure. Here Christopher Gotch throws new light on a formative period in Mylne's life, that of his travels in France and Italy, with the aid of a newly discovered collection of letters.*

Robert Mylne remains the enigmatical figure of the second half of the eighteenth century. The following collection of letters, recently discovered and published here for the first time, throws light upon his early years, a period of proclivity which actuated the future man.

The obscurity to which Mylne has been relegated since his death is over, and his worth is being reassessed in comparison with his contemporaries. The historians at the turn of the century considered him worthy of no mention: yet he was strong-principled enough to resist the influence of his friend, Robert Adam, unlike the vacillating Wyatt who achieved far greater fame with far less ability. Mylne epitomized the period of precision, because he was both architect and engineer bringing to the former role accuracy, refinement and simplicity of construction; and to the latter delicacy and economy of design, together with great ingenuity. He was the augur of the Industrial Revolution.

Robert Mylne was born on January 4, 1733, at Powderhall, Leith, near Edinburgh. He was the eldest surviving son of Thomas Mylne, master mason to the crown of Scotland who was the seventh Mylne in succession to hold the title.

From 1742, Robert attended Edinburgh High School which Adam left the same year. At the age of fourteen, he was bound apprentice and servant to Daniel Wright, a burgess of the City of Edinburgh and presumably a mason. Robert's indentures were signed on November 26, 1747, and lasted six years, at the end of which he joined his father as an assistant, and worked with him for a year, acting as carver on building work for the Duke of Atholl at Blair.

In 1754 he went to Paris, joining his brother William, who also studied architecture. He sailed from Leith, but a gale off Newcastle drove the ship into Yarmouth. While there, Robert scribbled a note to his father:

> Oct. 1754.
> '[I] was very sick for 48 hours afterwards and now I am a thorough seaman; the only thing that vexes me, I fear, is Will's impatience. I am just going to make my observations on this town.'

From Paris he wrote to his mother:

> Nov. 1754.
> '[Of the gifts I am sending] the most valuable of the whole, it is two pairs of silk muftees, the best in Paris for Betty and Jeany (Robert's sisters)† as likewise the buckle worn by the Prince to a suit of blue velvet when [he] landed first in Scotland, a piece of his coat, and a pickle of his hair, all of which I am sure you'll have a great veneration for, when you love the original so much. . . . I hope that our endeavours will be crowned with happiness as it tends, as we design it to gladden your old age and render you happy, if we can. [You] who gave us birth and then our fellow creatures.' (His brother and sisters.)

Early in December, Robert and William packed their few belongings, sent them ahead to Marseilles, and began walking. From Lyons Robert wrote:

> Dec. 1754.
> 'We footed a good deal of it, but we took carriage some time when opportunity served and came in [a] boat from Challon to this place. . . . Dear Papa and Mama I know you'll be a little uneasy that we are running thus so far off without consulting you about it, but I beg it of you to support this one effort for to appear something in the world. . .'

It appears that Thomas Mylne gave permission for his two sons to study in Paris and that the decision by them to go to Rome was taken suddenly. When William had suggested it in a letter from Paris early in the year Robert had interceded with their father on his behalf but without success. They reached Marseilles at the turn of the year.

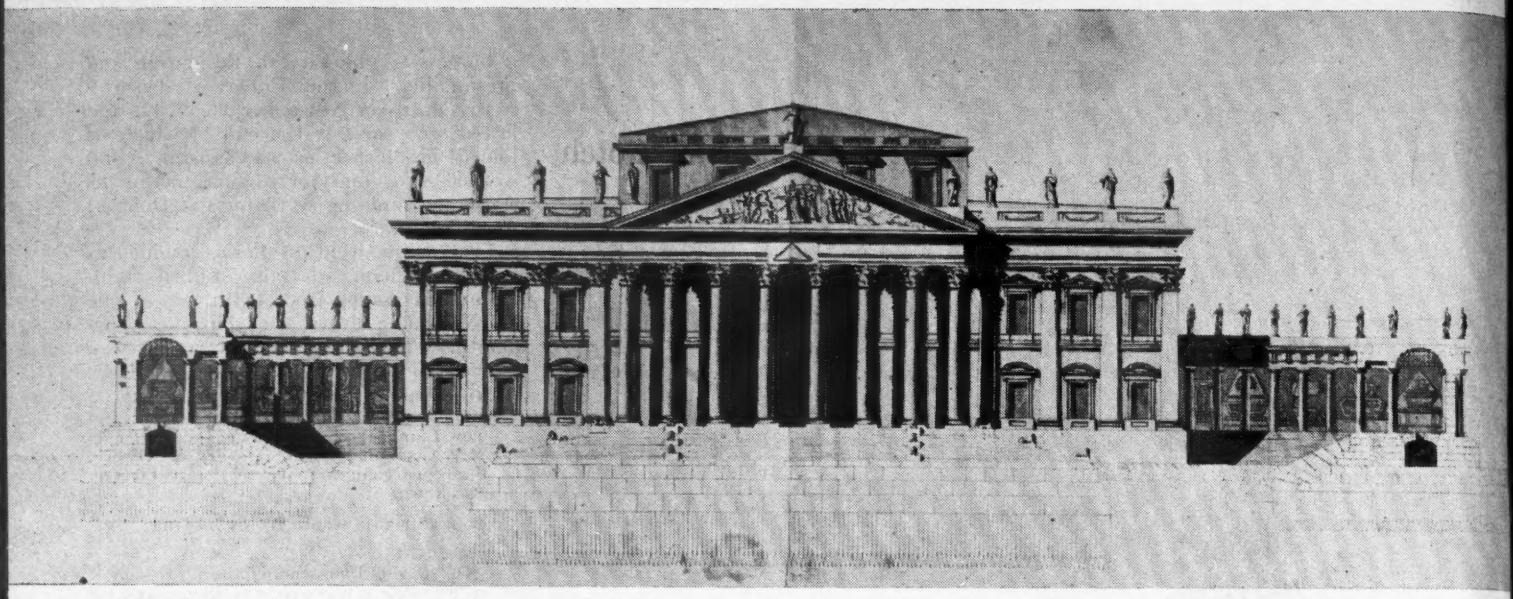
> Jan. 1755.
> '. . . we tramped it to Toulon, 36 miles distance . . . there we saw 14 Row galleys with 300 slaves in each, the most miserable sight that ever I saw in my life, being all chained by the legs and half naked. [The French] would not allow us a sight of [the arsenal] as we were Brittainers, for the French are very jealous of all such things. . . . The Buildings are all very grand and if they were in Scotland they would be reckoned as Palaces; especially in stairs they exceed all, but then the inside is not disposed nor half so clearly as the English. They affect large rooms but as they are badly furnished and worse furniture, they are not agreeable in so hot a climate. . . .'

The two brothers sailed from Marseilles across the Ligurian Sea to Civitavecchia, then the port for Rome. For some months there is silence until in the autumn Robert wrote home:

> Sept. 1755.
> 'In answer to your enquiry if we have wrought any [work] yet or not, I have a great many reasons for not having done so; first, that there

* The author wishes to acknowledge the kind assistance of Miss J. M. H. Mylne by whose permission the letters are quoted.

† NOTE: All notes bracketed thus (. . . . .) are by the author.



2, *Robert Mylne's winning design for the Concourse at St. Luke's Academy, Rome, in* 1758. *The subject was a public building with a memorial gallery to exhibit the busts of eminent men. Sectional elevation through the forecourt.*

> is not one workman to be compared with those in Scotland, in either France or Italy of both the trades in the manual part; but for designing and drawing they exceed us by far. It is not the small compass of drawing that you have an idea of, that is practised and learned by students here. I shall only mention what I have studied hitherto, to give you a notion what is to be learned here in that way. Measuring and drawing houses to form a good way of dividing them, various fronts of palaces, churches, ornaments for the inside of rooms which is my chief study, and drawings after statues, and a living model that stands for the purpose. Secondly, that you know unless a man settles for some years under a master, he cannot attain to any degree of merit in the manual parts of his business; so I think as we make but a short stay in one place it will be best to learn what belongs to the Master in the meantime, as we expect never to be always journeymen. . . . One vice, too common with our country, is not known here, which is drunkenness: a man is looked upon as worse than a beast who takes any more than for the support of nature.'

Thomas Mylne informed Robert that a rumour was circulating around Edinburgh that Robert Adam had been appointed to rebuild Lisbon which had been severely damaged by an earthquake. Robert answered in a letter dated February 11, 1756 (shortly before Robert Adam left for Spalato):

> '. . . I am surprised at your seriousness about Mr. Adam's rebuilding Lisbon . . . but I assure you [that] as an architect he makes no more figure than we do ourselves, for I see that a little study will make more than one family of architects in Scotland; but this is only to the Privy Council (the Privy Council to the court of James III, the old Pretender) [that] he makes a great figure here, keeping a coach and a couple of footmen. . . .'

Robert then tells a long story concerning the mistress of the Duke of Atholl, and how she rose from the scullery only to fall to worse depths through drink. His father tries to persuade him to return home, for the Duke wishes him to resume the carving at Blair. Robert replied spiritedly:

> '. . . if I am, in this short time improved so as to carry on the work at Blair, how much more shall I be some time hence . . . there is enough [here] for study these several years [hence] although I make the way as short as my capacity will allow. . . . Make that lad . . . do the enrichments of dining room and staircase; only let him take care to take the patterns from the former work in the lower house and to have respect in the cutting to the places they are designed for; as when in a high cornice to undercut them excessively to give them good effect. Mr. Campbell's [patterns] are as good as any for him to imitate. But I didn't like the taste of ornaments, neither of Mr. Campbell nor Mr. Swan, who gave you your design . . .'

With this letter, Robert enclosed a note for the Duke of Atholl himself:

> '. . . If you can refer the ornaments till I come home, you will do me a singular favour and it will be an inducement for me to come [home] the sooner, as I hope to show you quite a different manner [of architecture]. Drawings of all kinds. I am studying with the utmost application and shall begin shortly to model ornaments in day as the readiest method of getting a good taste, and when I return by Paris and London, I shall pick up what is good in either. . . . I have a very high opinion still of that lad's genius and merit.' (Thomas Campbell's apprentice.)
>
> Rome June 30, 1756.
>
> '. . . We are at present a fortnight returned from a jaunt to Naples where we were six weeks to see the beautiful remains of antique Architecture. . . .'
>
> (Herculaneum: excavated 1738 and Pompeii excavated 1748.)
>
> Rome Jan. 4, 1757. (To his father.)
>
> '. . . I am very much pleased with and approve your intended schemes in your last [letter] for my future happiness. But it seems a paradox to me how I should act according to your advice when you restrain the means how to do so.
>
> '. . . If his Grace (the Duke of Atholl) expects [that] I should move upon his Imperial command, you may write him that money makes the mare to go and, instantly, he might be surprised at my sudden appearance, with hat in hand to cringe upon his favour. Till I lie under these obligations to his Grace, I think I have reason to act according to my own sentiments—these are the future evils only that attend your dilatory remittances. For to tell you the truth, I won't stir from Rome till you answer my demands directly from London; and I appeal to our past conduct if ever they were extravagant—Dear Mama, I depend on you for the adjustment of our finances—not to mention your delays, perhaps from week to week, to postpone [sending] it . . . while we, perhaps, are starving in some village on the road. Whatever cause you may have attributed the former delays to, I see now that it was entirely your fault.'

The tone of this letter proved efficacious for the allowance given by Thomas Mylne to each of his sons was raised by him from £30 p.a. to a nominal £60 p.a. though in actual fact Robert records that he only received £45 of it.

William decided to return home and started to walk northwards, staying a few months at Venice, whence he visited many of Palladio's villas, some of which he measured. Robert, true to his word, remained in Rome, though he continued to visit historical sites besides studying the water system of Ancient Rome. William wrote to his brother from Vicenza:

> Nov. 1757.
>
> '. . . I am glad you were so diverted in your Tivoli expedition as likewise [in] your journey to Porto D'Antii and Nettuno. . . . You ask me about your portfolio and straining board . . . the last, Mr. Nevay (who was studying Art in Rome and whom they had first met in Paris) has. . . . I find myself much interested in his welldoing, notwithstanding all the damned quarrels we have had and let me know who did your portrait. . . .' (Brompton, d. 1782, drew a pencil sketch of him which Vangeliste engraved.)

During this year, Robert had spent the late summer and autumn months touring Sicily, and from his sketches and topographical notes he proposed to publish a 'Work' on Sicily with especial reference to the Greek remains at Taormina, Syracuse and Girgenti. Only a map was ever published and that while he was still in Rome in 1757; the remainder of his material he kept until his later years, but he was still working on it when he died. Winckelmann wrote in his notes on Girgenti in 1759, published in 1762, that his report was based on a communication received from Robert Mylne 'who had carefully investigated the site.'

William wrote to Robert a month later:

> '. . . Your remarks upon Mr. Nevay, I believe, are very true . . . but I am afraid he will disappoint the great expectations of his parents all owing to his dilatory manner [as] he might have been in England making a figure.
>
> '. . . You say he has fix't it to go home with you and likewise you don't expect it. I believe you might have said you don't wish it. . . . I found him a very uneasy companion.'

In January, 1758, Robert wrote home, and besides eulogizing William, he asked for more money and some new shirts. To

William he addressed a letter dated February 11, in which he mentioned that many Scotsmen and students were arriving in Rome:

> '. . . I am at present searching out a draughtsman to be sent into Sicily very soon to do over again what was done by Nulety.[1] [Mr. Felps] (who offered to publish Robert's "Antiquities of Sicily") has sent me . . . a letter [that he has written] to Nulety clearing me of any underhand play towards him.'

William reached home, after a rough journey across Europe due to the outbreak of the Seven Years War, where he received a letter from Robert:

> '. . . I had this winter, by the recommendations of Abbé Grant, Mr. Fermor, an English Gentleman for my pupil. He is determined to build a house when he goes home and therefore wanted to know something of architecture beforehand. He took lessons every evening . . . he likewise gave me his address and desired particularly to call upon him when I returned to England. He is worth about £7000 a year in Oxfordshire so that perhaps something may turn out of it. . . .'

The result of this meeting was the design and building of Tusmore House for William Fermor, a prominent Catholic who helped to secure the passing of the Catholic Relief Act of 1791.

> '. . . My next employment was with my Lord Garlies[2] . . . [who] . . . likewise learned of me the principles of architecture . . . and we became so familiar at last that he could never be without me. . . . Likewise as My Lord is very fond of every countryman he meets, that are likely to do well, especially he was so of me, whose family, he knew, had lorded it over stone and mortar for time immemorial in Scotland.
> '. . . I am at present making an invention for a small house to a merchant at Dresden . . . his application, which was by means of Mr. Dance[3]—at present a painter in Leghorn, to me was partly for the inside of the English houses and the outside of the Italians. I wish only that I may succeed in it as it will be the first of my doing except indeed that [house] where you live in at present, for it will always be like my darling child as it was the production of my earlier years.'

[1] There is no trace of this person who was employed by Mylne for measuring work in Sicily to be used as illustrations in the proposed 'Antiquities of Sicily.' Obviously, they had quarrelled and Nulety had accused Mylne of injustice.

[2] John Stewart, Lord Garlies, succeeded his father as Earl of Galloway in 1773. He was two years younger than Robert and died in 1806.

[3] Mr. Dance was Nathaniel (later Sir Nathaniel Dance-Holland) elder brother of George Dance the younger. He went to Italy in 1755 and in 1758 was joined by his brother.

In June, 1758, Robert quarrelled with Nevay, the painter, because he failed to finish some drawings for Lord Garlies in time. Nevay settled in Rome and was still living there in 1791. Writing to William, Robert reported the death of the Pope and mentioned the new people in Rome. He also suggested that Lord Garlies might be of use to him as he was going to London. Already Garlies' brother-in-law, Mr. Murray of Broughton, had asked that Robert should design his new house.

Robert had been studying at the Academy of St. Luke for some time past, and a year ago the subjects for the concourse had been announced. He had begun drawings

> '. . . which cost me seven months hard study but the concourse was put off on account of the Pope's death. However . . . on the 6th of this month (September 1758) the drawings were put in. On the 7th we made our Provas in the space of two hours before the Academicians when an altar adorned with composite columns fell to our lot in the First Class [of Architecture] to be done.
> 'I am sure you are quaking for me now—with that cursed subject—however I made it out and a very fine one [too]—in comparison with the rest—a few days afterwards they were all judged in the presence of the Cardinal Camerlengs; when the first prize was unanimously allowed me—think on my heart when I received the news—thump, thump, thump, I feel it yet. . . .'

He received a silver medal in the presence of 16 Cardinals and a large gathering of the élite of Rome, ambassadors, nobility and artists, at an impressive ceremony. 'I was obliged to bear the eyes of the whole multitude,' he says, and suggests that William inserts a paragraph in the local paper stating that he is the First Briton ever to win first prize at the Academy.

> Rome Dec. 1758.
> 'The utmost summit of my wishes when I undertook it, was the improvement of myself which I am sensible now was not a little and even more than all that I had gained for many years before . . . [I was awarded the medal for the reason] that I had interpreted the meaning, composed the architecture and drawn it with more knowledge of light and shadow than any. I say that although my principal view was self-improvement in these particulars, yet I have found many advantages from it since and every day they increase upon me.
> '. . . I am . . . making different sketches for Sir Wyndham Knatchbull who intends to build a house on his own estate in the county of Kent. He is a good, sensible man, just come of age, of £4000 a year and so far as yet . . . we have hit it [off] very well.'

This house was Mersham-le-Hatch, which was actually built by Robert Adam in 1762. Designed in a much more restrained manner compared with Adam's later excesses, Mersham is similar in style to Mylne's country houses of Tusmore, Kidbrooke and Wormleybury.

> 'I am teaching architecture to Mr. Knight of Kent worth £7,500 a year, also to Mr. Milles of a very considerable estate. I expect something among them to determine the later part of my life for, after a chance of fortune, a steady conduct and strict pursuit of what we aim at, will sooner or later bring us to it.'

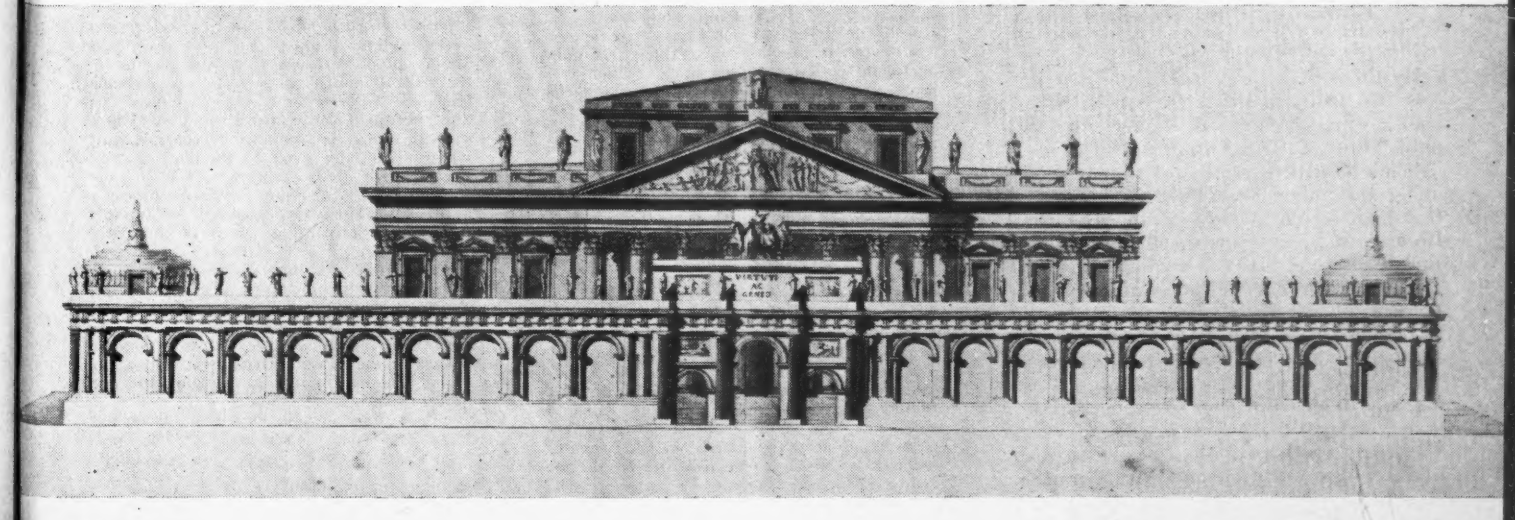
Robert mentioned that he had met, through Garlies, and was intimate with My Lord Archibald Hamilton, 'brother to the late Duke. He is a nice lad of 19 . . . and as all his estate lies in England I expect a great patron in him.'

> '. . . From the whole purport of the above you may see very well my intention in the world for I intend to settle in London . . . a prophet is better believed out of his own country than in it. For my countrymen would have a very good right to question the merit of one whom they know spent seven years in the profession of [which] only one part of that business [do] I profess at present. I have more friends in England and it is easier to get money there.'

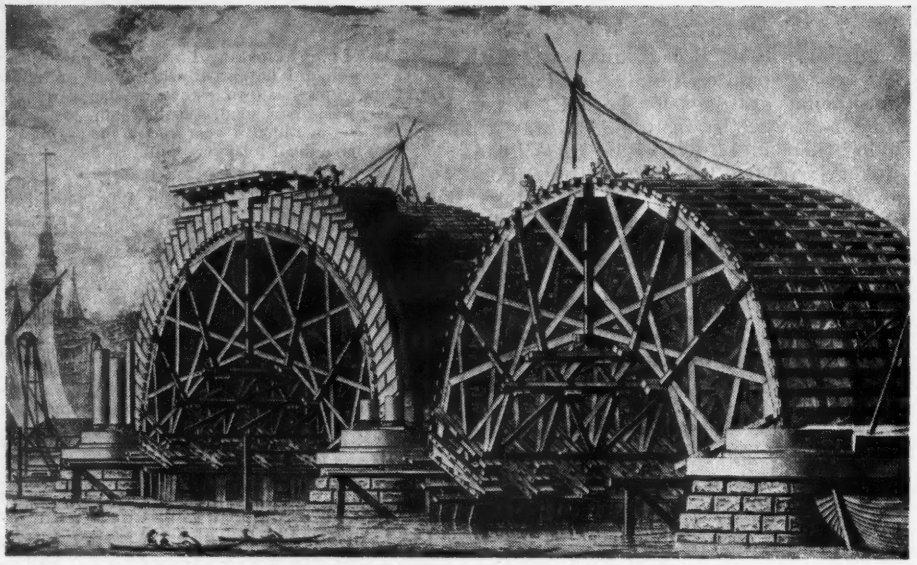
Here he requests £40 to purchase the toga in which he is to be elected an Academician of St. Luke; but he hopes to avoid spending the money because he thinks he will earn enough through teaching English Gentlemen.

> '. . . [On] Sunday last I was elected . . . a professor of the Academy of St. Luke. . . . Those not acquainted with me, take me for a prodigy and these that were, are surprised at my starting up so soon. My Lord [Garlies] is vastly pleased and congratulated me upon my having gained first prize. He wrote about the plan for Mr. Murray's House. I shall think upon it as I journey home and shall have particular care to succeed in this, that I may introduce you [William] by it into the great world in Scotland. I am going North with Mr. Felps who agrees that I should begin the "Antiquities of Sicily" on my return to London.'

William wrote from Edinburgh that stories were circulating of how Robert had been knighted by the Pope. From Florence, where he was elected a member of the Academy of Art, Robert replied on



3, principal elevation of Mylne's design for the Concourse at St. Luke's Academy, Rome, showing the influence of Soufflot and Peyré. The second prize was awarded for a design similarly inspired by the prevalent French style. These were the only two designs of neo-classical origin.



4, The engraving of Blackfriars Bridge by Piranesi executed in Rome entirely from descriptions in a letter from Mylne. It emphasized the springing of the timber centres from the pier foundations and the copper covered wedges, invented by Mylne.

April 6, 1759:

> '. . . I left Rome, I may say, loaded with riches and honour. The first to be sure was not great but still much, in proportion than when I arrived there; as to the last no more could be acquired by any in my profession. I am very glad to hear of your success [William had just been commissioned to design and build the New Bridge over the North Loch in Edinburgh] and hope, when I shall be returned, to introduce you to some good people as I am either acquainted or have letters to a good number of them.'

Robert stayed at Brescia during June, 1759, and commented indifferently on Palladio's work to his brother, and added that he did not bother to sketch any particular building. He mentioned, too, that Garlies said that the sketch plans for Broughton were liked by Murray, but that it was not what he wanted; and that this was not surprising considering that Robert could hardly know, having never met him.

Instead of returning home through Paris, Robert followed William's route through Switzerland and stayed a few days in Basle and Zurich, both of which he liked. He described his journey up the Rhine to Rotterdam in a letter to William, dated July 10, 1759, from The Hague, and continued:

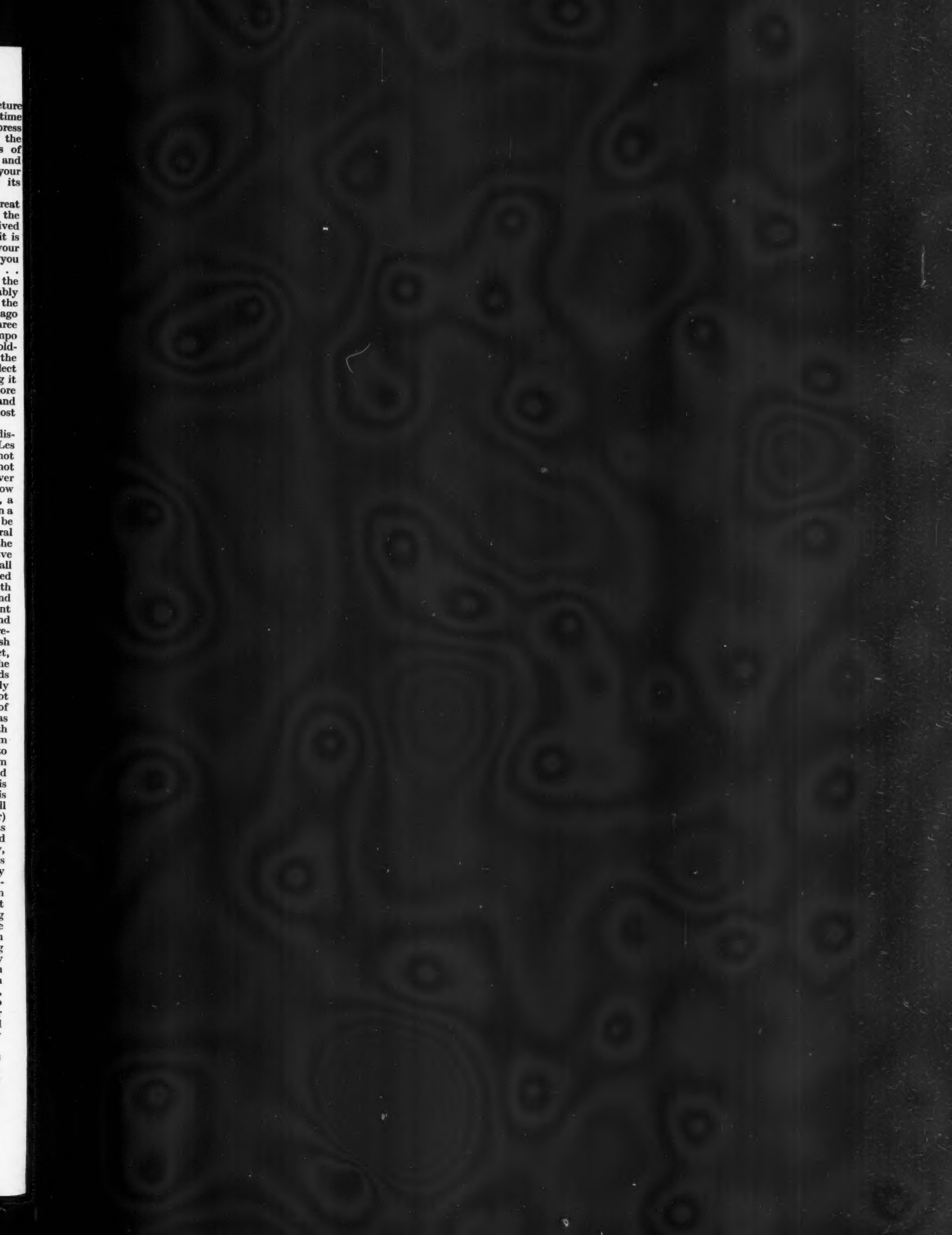
> '. . . probably I may go to Amsterdam with an intention to be well acquainted with a country so new and so much connected with the mechanical part of our trade. . . .'

By the 17th he was in London, lodging with Mr. Doby in Litchfield Street, Seven Dials, and already arranging for the publication of 'The Antiquities of Sicily.'

While studying in Rome, Robert came under the influence of Piranesi, and from this final letter it may be inferred that Robert was instrumental in introducing Piranesi's etchings to the English dilettanti. To Robert, however, Piranesi was more important in convincing him to follow the path dictated by Roman Antiquity despite his experiences of Greek architecture in Sicily. This decision is most interesting, for it provides the clue to Robert's constancy in face of fashion in later years when the Adam brothers dominated the English architectural world of the 1770's. Piranesi, the literary opponent of Winckelmann, seems to have opened the doors of his atelier to all the English students in Rome.

Sixteen months after his return, Robert received this letter from Piranesi:

> Mrsignr Roberto Mylne
> Architetto Celeberrimo
> At the Doby's in Litchfield St. London.
> Dear Sir,
>
> Your esteemed letter dated 7th September last assured me, not only that you were by no means forgetful of our mutual friendship but that it will be eternal; because in these times, when flattery supersedes sincerity, I received from you a confirmed proof of its existence towards myself. It is no trifling consideration, that of your own accord and in a country so distant, that who knows if ever we shall meet again, you have been the first to seize the opportunity of sending me an account of your health; and a proof of the remembrance you preserve of me. . . . You lament that the proofs of friendship consist of words destitute of performance—but words have however all the weight when in order to have facts to substantiate its sincerity . . . through your unsolicited kindness, Lord Morton, a professed scholar, as you say, has by a friend of yours . . . sent an order to Rome for the purchase of a copy of all my works—This is a great thing. . . . To this proof of your kindness and true friendship, may be added the other which you have exhibited in co-operating in the sale of some number of my works . . . what other proof would you wish to give me to convince me of your affection for me. I believe it—I feel assured of it—and I thank you from the bottom of my heart. . . . Nor do the civilities which I have experienced from you terminate here; there is more particularly that . . . description which you have given me of the great bridge (Blackfriars) which you are to construct over the Thames—The account is brief to be sure but containing the most important particulars of the vast size of the structure, of the difficulty of the undertaking and of its grandeur—which will proclaim your genius to the whole world, perpetuate your fame and reflect honour upon those who have elected you to be author of one of the most glorious works of English magnificence. I was desirous not to conceal such information from our Roman as well as English friends and some . . . have transcribed it in their memoirs—Ah! Why cannot I also as well as so many others enjoy the sight of the undertaking and accomplishment of the work? But thanks for your promise, through which I shall not be wholly deprived of such a pleasure, to send me shortly *an exact copy of this work*—these are your own words—do not fail to remember it because I am expecting it. My Work 'On the Magnificence of Architecture of the Romans' has been finished some time since . . . it consists of 106 sheets of letterpress in Italian and Latin and of 50 plates, the whole on Atlas paper. The antiquities of Greece brought to light by Mr. Le Roy and which made its appearance here after your departure from Rome, contributed to its enlargement.
> I ought moreover to declare to you my great delight that besides the undertaking of the bridge, you have in the meantime received more orders for other works. From this it is evident that where you have added to your fame so glorious a proof of your talent, you will have nothing to fear from envy. . . . The Statues . . . are being executed at the Fountain of Trevi and are considerably advanced. I must inform you [too] that the Conservatori of Rome, a few days ago having ordered the restoration of the three columns and their entablatures at the Campo Vacino, which threatened ruin, and a scaffolding having been erected which reached to the summit of that monument. I did not neglect the opportunity of drawing and measuring it in all its parts; and in order to be the more exact I have drawn it of the same size and copied all its ornaments with the most scrupulous diligence.
> . . . On examining these antiquities, I discovered that [Desgodetz] (Author of 'Les Edifices Antiques de Rome,' 1682) had not been so exact as he is considered to be, not even tolerably accurate—however I never said anything about it. But upon being now attacked by Mr. Morand . . . Frenchman, a decorative painter of the City of Lyons . . . in a matter in which diligence could not be carried to a greater extent, [I] took several Englishmen to the monument, and on the spot with Desgodetz in my hand, have shown them that this author has varied all the ornaments and consequently has altered most of the dimensions and moreover with presumptuous freedom censured Palladio and other compilers of antiquities for their want of diligence in copying the ornaments and taking the measurements. Mr. Morand frequented the Café Inglèse where my English friends, being instructed by me, how to act, referred him to the inaccuracies of the author he so much esteemed. . . . Afterwards I saw Mr. Morand himself and he immediately anticipated me by saying that he did not require to be persuaded by the want of accuracy in Desgodetz, because he was convinced from having been together with several other Frenchman and among them the Students of the French Academy to visit several antiquities and compare them with the book of the said author: he added that he had acquired credit through this medium by which he became rash in his judgements. . . . As the scaffolding still remains . . . Mr. George Dance (the younger) who is well known to you, and who has particularly studied those antiquities resolved not to neglect so favourable an opportunity, as the present, for taking castes of the parts of the said monument, and he is now actually at work there—Now these castes will hereafter serve in England to justify my criticism of Desgodetz. I must also inform you that Monks of S. Croce-in-Gerusalemme having for several months caused the amphitheatre Castrense to be excavated . . . I have been also occupied in drawing and measuring several times the remains of this antiquity wholly laid bare even to its plan. It is in itself worthy [of] attention and is so much the more so, as the parts which compose it, as . . . Mr. Dance also observed, are found to differ materially from those of any other amphitheatre, which renders it doubtful whether this was one—suffice it—some day I shall publish the drawings.
> May you continue in good health; in this wish all your friends cordially unite with me; and truly rejoice at your success. Continue to favour me with your friendship and believe me to be, with the utmost affection and most grateful acknowledgements
>
> Your most humble, devoted and obedient servant.
>
> GIO. BATTISTA PIRANESI.
>
> Rome, Nov. 11, 1760.

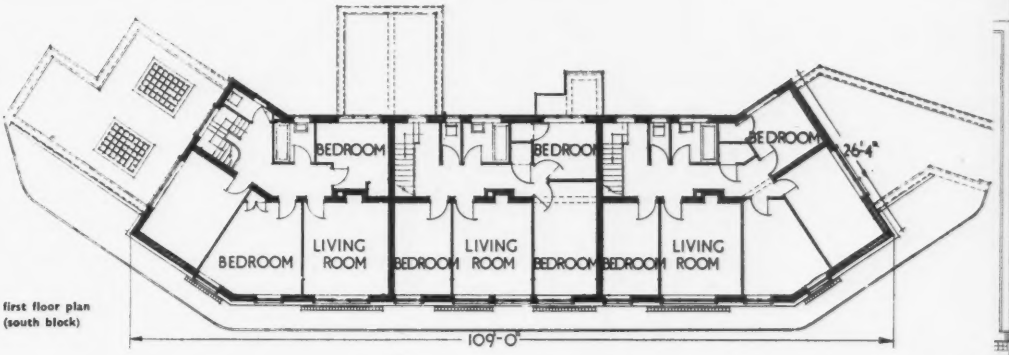


SHOPS AT HORNSEA

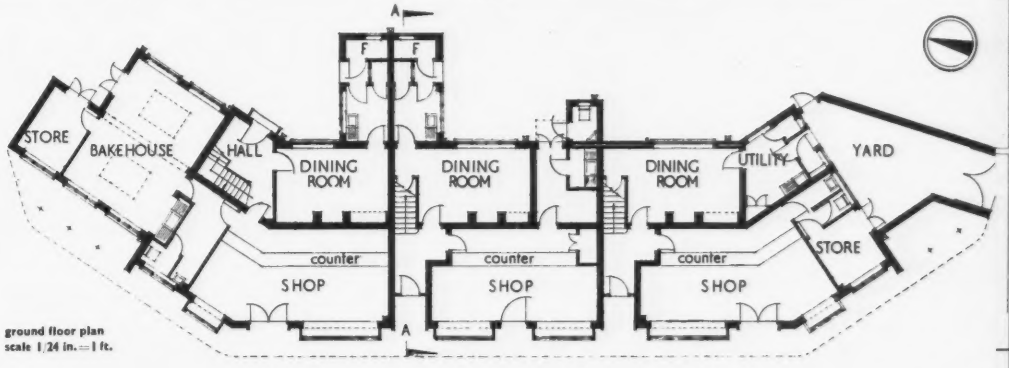
ARCHITECTS: A. C. BLACKMORE & CO.: In association with Gregory Wilson

The new housing estate at Hornsea Burton, East Yorkshire, which covers 25 acres, is some distance from the town centre and it was thought necessary to provide a group of shops to serve the 274 houses and flats which will form the estate when completed. Each block has a service road at the rear. Living accommodation, which includes three or four bedrooms on the first floor, can be let apart from the shops. Cantilevered canopies, which give some weather protection to shoppers, are extended beyond the main blocks to give cover to bicycle stands placed in recesses in yard walls behind the main building line.

The construction consists of reinforced concrete floors and roofs with walls of 11-inch cavity brickwork. The flat roofs are covered with a three-layer felt and bitumastic covering. Shop windows are of reinforced concrete as a box frame in front of the main walls. Each of the front walls of the shops on the underside of the canopies is faced with 9-inch by 6-inch faience tiles for cleanliness. The type of lettering is to be controlled and free-standing letters are to be fixed above the shop windows, lit from above from glass lenses in the canopies.



first floor plan (south block)



ground floor plan scale 1/24 in. = 1 ft.

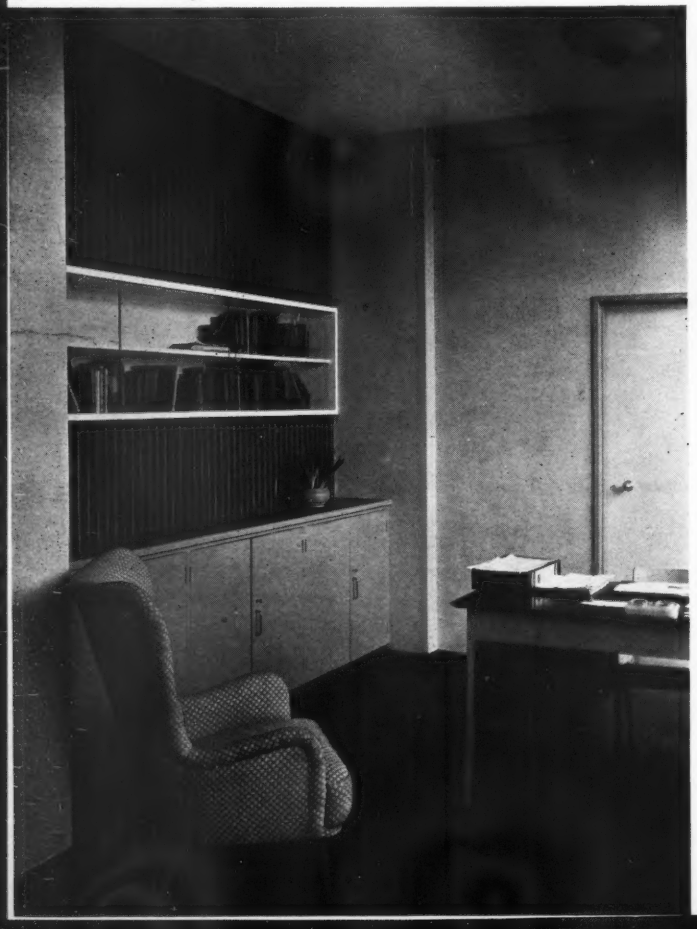
1, *view looking south-east.*

2, wing containing laboratories and library, looking north.

GIRLS' SECONDARY SCHOOL AT CANTERBURY

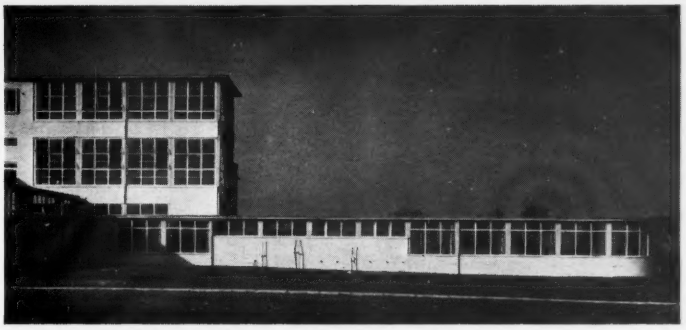
ARCHITECT: L. HUGH WILSON

3, headmistress's study.



This 3-form entry Grammar School consists of a single-storey block parallel to the main road containing entrances, assembly hall, dining room and kitchen, staff rooms, gymnasium, cloakrooms and lavatories with a two-storey wing containing classrooms and a three-storey wing for practical and special rooms both at right angles. Both these wings have a south-east aspect and can be extended when required. The main entrance, assembly hall (with fully equipped stage and green rooms), staff rooms, dining room and lavatories have been planned to form an independent unit. The structural frame consists of *in situ* reinforced concrete columns, beams, floor slabs and roof slabs. Externally, the building is clad with reconstructed stone-faced concrete slabs, 3¼ inches thick, supported on the toe lintels in the reinforced concrete frame. Roofs are screeded with lightweight concrete and covered with built-up roofing with paved finish. Upper floors are screeded on an eel grass blanket laid on top of the structural slab to minimize structure-borne sound. Ceilings are of insulation board in teaching rooms, dining room and adjacent corridors, sprayed asbestos in the music room and entrance hall and plaster elsewhere.

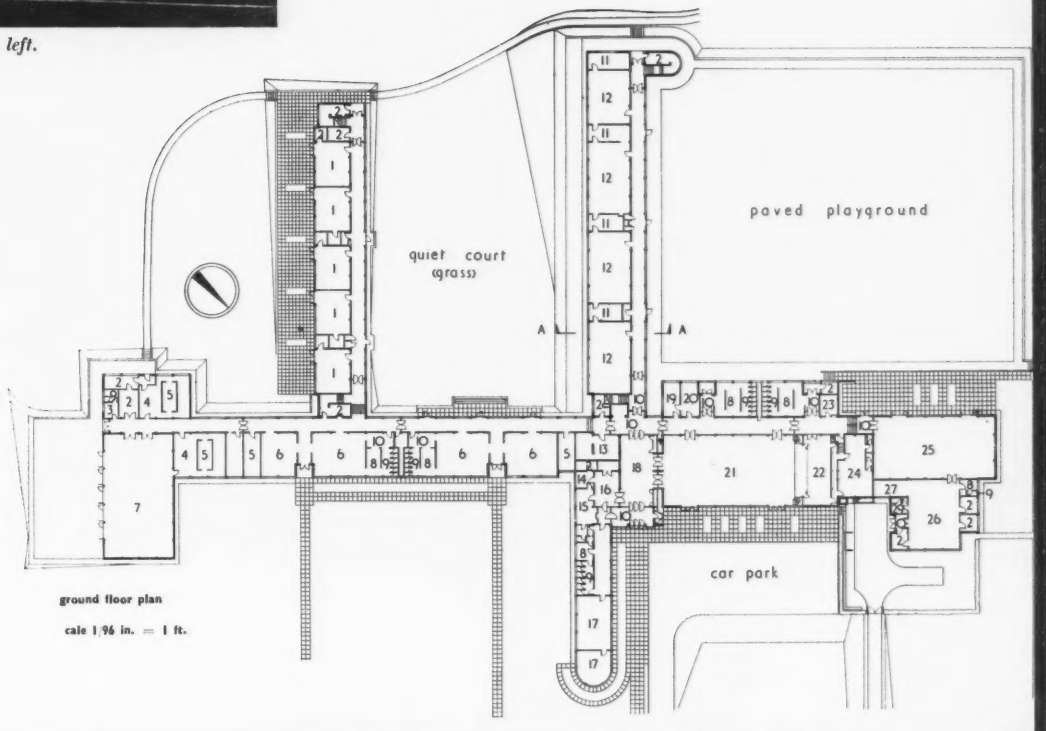
Girls' Secondary School at Canterbury



4, staff wing with art and music block on the left.

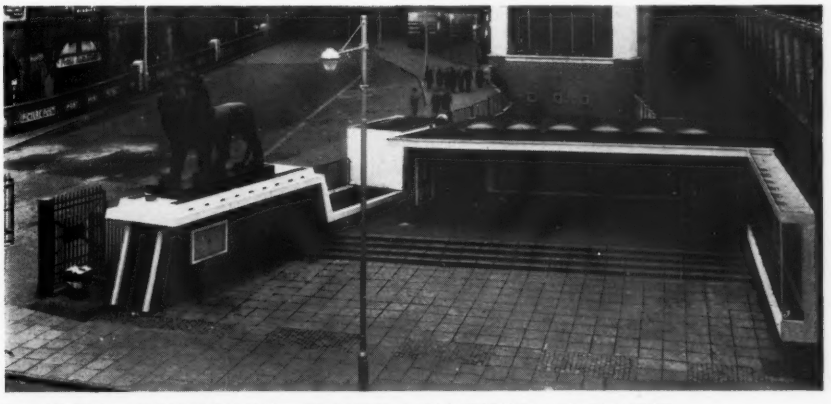
key

1, classroom. 2, store. 3, P.T. mistress. 4, changing room. 5, drying space. 6, cloakroom. 7, gymnasium. 8, lavatory. 9, W.C. 10, lobby. 11, laboratory preparation. 12, store. 13, book store. 14, secretary. 15, headmistress. 16, staff hall. 17, staff room. 18, entrance hall. 19, staff room. 20, waiting room. 21, assembly hall. 22, stage. 23, caretaker's workshop. 24, dressing room. 25, dining room. 26, kitchen. 27, wash-up.



ground floor plan

cale 1/96 in. = 1 ft.



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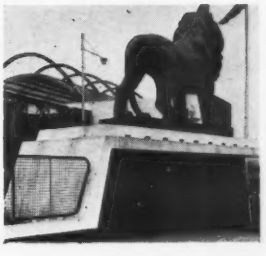


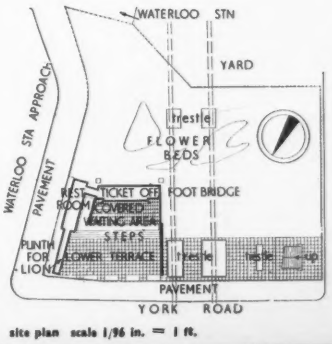
6

5, general view of the booking office. 6, the lion and pedestal. 7, box office windows.

ROYAL FESTIVAL HALL BOOKING OFFICE

ARCHITECT: SERGEI KADLEIGH

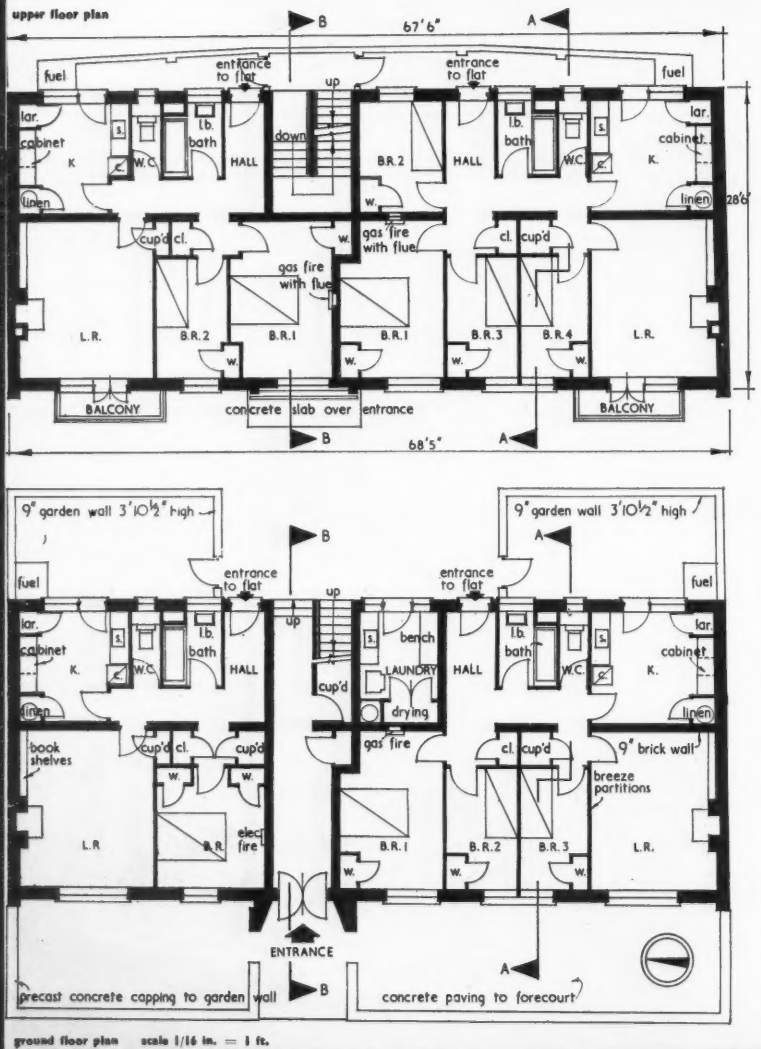
This temporary booking office for the Royal Festival Hall is part of the scheme of street decorations for the Festival. Its architect was required to design a setting for the large Brewery lion, salvaged from the South Bank site, and to provide as large an open garden area as possible. The existing pavement in York Road has been extended to form a terraced forecourt leading to a covered area outside the ticket office windows. External walls are brick, partially rendered with breeze and plaster internal partitions. The wood joist boarded roof is surfaced with bituminous felt. The wall containing ticket office windows is framed in timber on a brick plinth. Externally, polished plywood surrounds window panels contained within a wide cement rendered frame. The external wall facing Waterloo Station is covered with seven decorative panels, designed and executed by Mrs. Lesbia Kadleigh.



site plan scale 1/96 in. = 1 ft.

7

8, *west facade facing Oakford Road.*

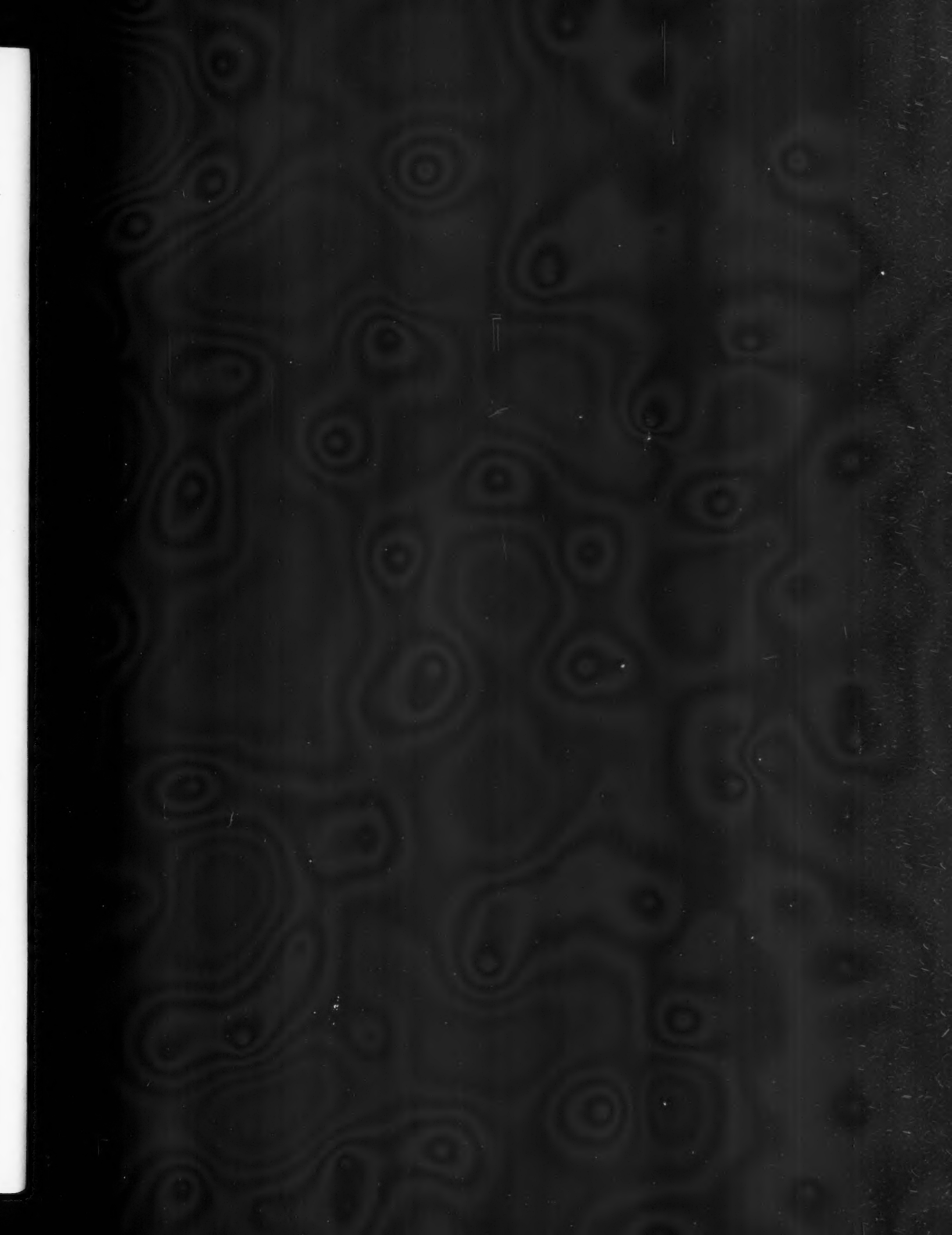


ground floor plan scale 1/16 in. = 1 ft.

FLATS IN KENTISH TOWN

ARCHITECTS: HUGH ROBERTS AND DAVIES

This block of 3-storey flats replaces four bombed terrace houses. Walls are of load bearing 13½-inch cavity brickwork. Floors and roof are of a patent precast concrete construction. Walls are faced externally with sand-faced flettons. Balconies on the west side are faced with fluted concrete at the front and have reinforced brickwork at the rear. The windows over the main entrance are flanked by panels of blue tiles. Metal windows have been painted ivory, ironwork grey and doors to the flats are painted alternately opal green, blue and vermilion. Internally the brickwork surrounding the staircase has been left fair faced with flush jointing. Soffits, balustrades and ceilings are treated with stone paint. Walls of flats are distempered. The floor finish to the main entrance hall and staircase is granolithic, and elsewhere is in patent 'asphaltic' tiles. Oil paint is used in kitchens and bathrooms. All main bedrooms have built-in wardrobes, and kitchens are provided with built-in EJMA units. A laundry is equipped with an electric washing machine, sink and drying cabinet. Domestic hot water is obtained from a lagged electric water heater in the linen cupboard of each flat.



Phoebe Stanton

PUGIN AT TWENTY-ONE

Pugin was twenty-one years old in 1833. In that year he executed the series of drawings of an imaginary deanery which was evidently meant to be a book of the same format as *Contrasts*. *Contrasts* came out only in 1836 and so Mrs. Stanton's discovery provides us with Pugin's earliest work for publication; one that is particularly revealing to an understanding of his further development.

THE DRAWINGS FOR A Deanery, here published for the first time, are of importance in the story of Augustus Welby Pugin and his art in so far as they are the earliest Pugin drawings known (with the exception of the sketch of Christchurch which Benjamin Ferrey reproduced in his biography) and they present a projected or dreamt original building, the site, and the complete interior decoration and furniture for it. The drawings are dated 1833; Welby Pugin was twenty-one when he did them.

Before he reached maturity Pugin's excited affection for Gothic architecture and design had been stimulated by travel in England and abroad and the training his father had given him. Augustus Pugin was an informed and skilful artist and teacher when his son was developing. By 1833 the younger Pugin had assisted in the illustration of his father's books, had made for himself a reputation as a designer of Gothic furniture and of stage settings in the Gothic style, and had, as these drawings show, focused the curious intensity of his enthusiasm upon late mediæval architecture. So great was that enthusiasm that he had taught himself—not at all a matter of course at the time—to be accurate in his mediæval detail, to make use of what he called his 'authorities,' and in short, to begin the accumulation of the encyclopædic knowledge of mediæval art from which he was to create the churches he built in England and Ireland, his books on the Gothic Revival, and his enormous output of designs for church furniture, stained glass, textiles, ceramics, and domestic architecture and furniture.

The drawings of the Deanery are bound together, numbered, and each one signed, in a green morocco volume, gilt edged and tooled in a pattern of quatrefoils and lancets. Presumably Pugin himself designed the binding, for he had many of his drawings uniformly and expensively bound some time in the 1840's when illness and discouragement convinced him he would not live long. Altogether there are thirty-seven pen and ink drawings, each on a page nine by seven and a quarter inches. Many have ample margins and even the aerial perspective (1) and the drawing of the interior of the chapel (14), the largest of the group, are only five and a half by seven and a half inches. Pugin throughout his life seems by preference to have drawn and sketched in the diminutive, a method which gives his drawings a singular fragile vividness. This affection for the small, almost microscopically accurate drawing seems in curious contrast to the exuberant floridity of his personality.

The little book is now the property of Mrs. Flory Mackey, daughter of Peter Paul Pugin, architect and youngest son of Welby Pugin, and it is through Mrs. Mackey's kindness that reproduction and study of it is possible.

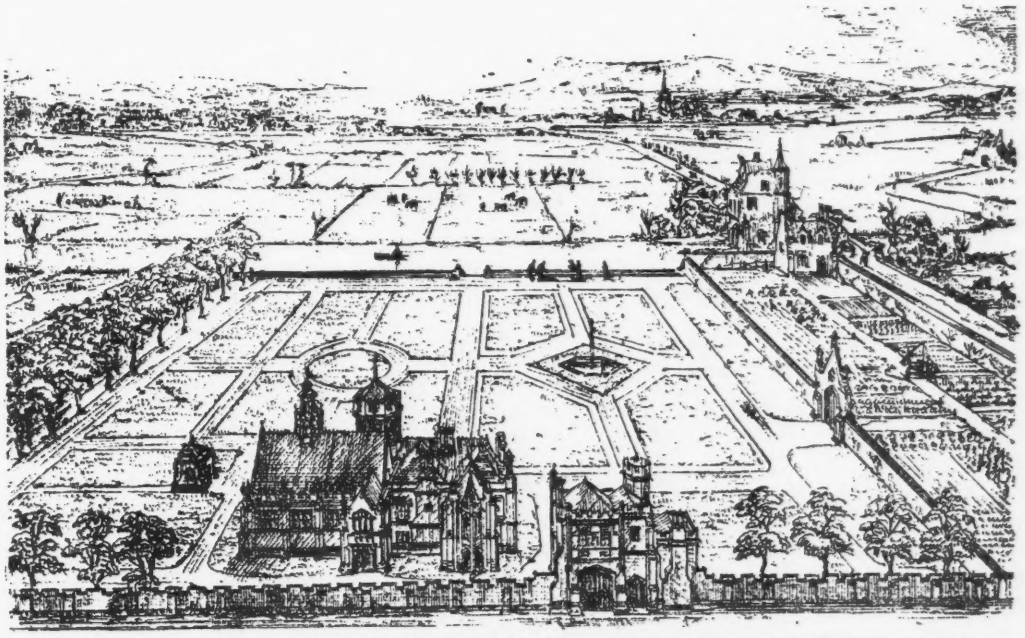
Sixteen of the drawings are omitted here. They are principally those for the smaller buildings which Pugin designed to surround the house, but examination of the aerial perspective will give some idea of the style of the outlying buildings and the garden which Pugin created as part of the cluster in which the Deanery was to be set.

The aerial perspective 'View from the Spire of ye Cathedral' is certainly Salisbury. Pugin loved Salisbury; indeed, a few years after these drawings had been done he went to live there attracted by the cathedral, its library, the fragments of the mediæval town, and the beauty of the Wiltshire countryside. The Deanery is a perfect fifteenth century Salisbury house. The plan indicates that it was to face the west entrance of the cathedral. From the spire of the cathedral it is clear that Pugin meant his building to stand on the west side of the Close where the Old Deanery stands to-day and that the gardens should run west to the river. The course of the river is given accurately; the mill at the extreme right of the drawing is nearly at the site of the present mill at the Mill Race. The landscape beyond the river underwent at Pugin's hands, however, considerable grooming. Such tidying up of the scene is not unusual, but when the perspective is compared with the actual site it is clear that Pugin's building, some eighty feet in length, would have required and is illustrated as having, a deeper distance to the river and a longer west wall on the Close than the actual site would permit a building of that size. No early maps of Salisbury show a straight road running from the north edge of the Close on west to the Avon, nor does any record appear of a bridge and mill at the point where such a road would cross the river. Pugin includes plans and sections of bridge, which he designed himself, but he gives only a delicate and finished sketch of the mill as though it were there already. The road, the proportions of the house to the size of the site, the bridge, and the mill, all indicate that inspired with the deep affection which he felt for Salisbury Pugin selected what seemed an idyllic site on the west of the Close and for it created a perfect early Tudor house. Then, because it was an imaginary building he could with impunity submit the site to discipline and design an orderly and equally ideal composition of road, old mill, distance, and fifteenth century garden to frame and amplify the charms of the house itself.

This is the house of John Skelton, Dean of Salisbury. Pugin knew enough about the emphasis placed upon the individual in the decoration of early Tudor houses to realize that without an owner whose coat of arms and name could appear in decoration and heraldic glass, the Deanery would lack much. Everywhere appear the initials JS, the shell and tun, the name Skelton. Puns upon names were common in the fifteenth century and the tun was one of the commoner symbols used. John Skelton would be reminded of his name and station in life some twenty times as he walked about his house. The furniture in the retiring room is carved with the letter S, and the Dean, as he sat upon the dais in the hall, could read across the screen : 'This house was builded by John Skelton. . . .' The fireplace in the Dean's chamber is ornamented solely with the name, the date, 1471, and the pun upon the name.

But, there was no John Skelton, Dean of Salisbury. Did Pugin select the name for its late fifteenth century association with Skelton, the poet, whose work he may have known, and because the shell and tun provided such pretty decorative possibilities? Pugin, young and without a building practice, exercised his knowledge and pent-up brilliance in the fantasy of a building upon a site for which any Gothic Revival architect might wish.

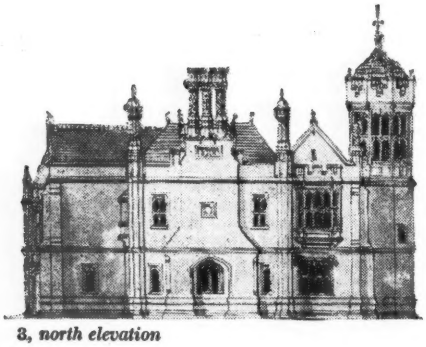
Brilliant and technically precocious as the drawings are, they still have their little illogicalities. There is no plan for the first floor, and the five sections, four elevations, and north-east and south-east views do not make clear just what the space over the porch at the east end of the central corridor was to be and how the four bedrooms on the ground floor were to be managed. In the south elevation neither the staircase tower nor the chapel front appear, though they would have been visible from the south end of the building. Having expended his imagination on the Dean's apartments, chapel, bedroom, and chamber, Pugin could not make up his mind whether the guest room should have a two-light window, as appears in the drawing of the room, or a three-light window as appears in the elevation. And the fireplace is not the one he assigns to the guest



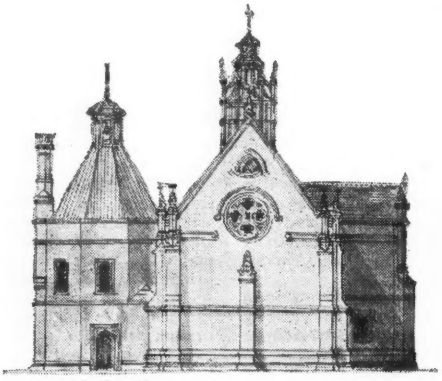
1, *view of the Deanery from the spire of the cathedral. It is almost certain that Pugin had Salisbury in mind.*

Pugin at twenty-one *Pugin's drawings of John Skelton's deanery number thirty-seven in all, and are contained in a book whose page measures nine by seven and a quarter inches; twenty-one of them are reproduced on this and the preceding and following pages. They show that already at twenty-one Pugin's style of drawing was fully developed. They also show that he already had a profound knowledge of fifteenth-century architecture. Historical precedent exists for every structural and decorative feature of this building, though Pugin has not hesitated to modify the usual plan of the Tudor house in the interest of nineteenth-century convenience.*

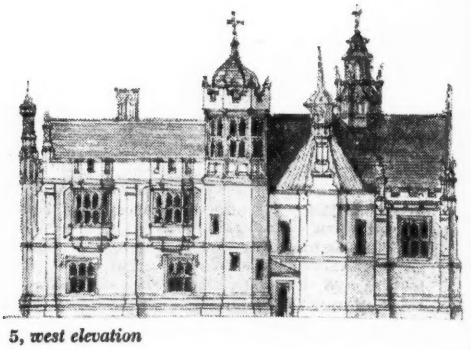
2, *east elevation*



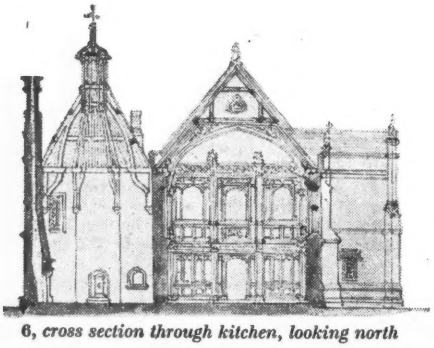
3, *north elevation*



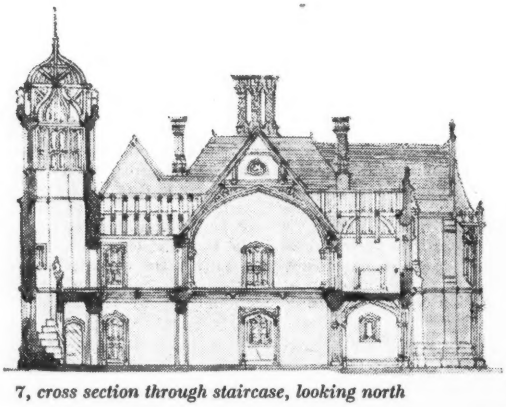
4, *south elevation*



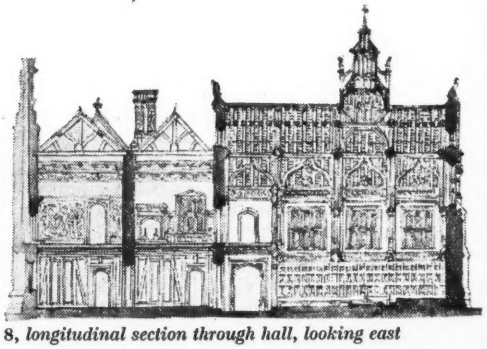
5, *west elevation*



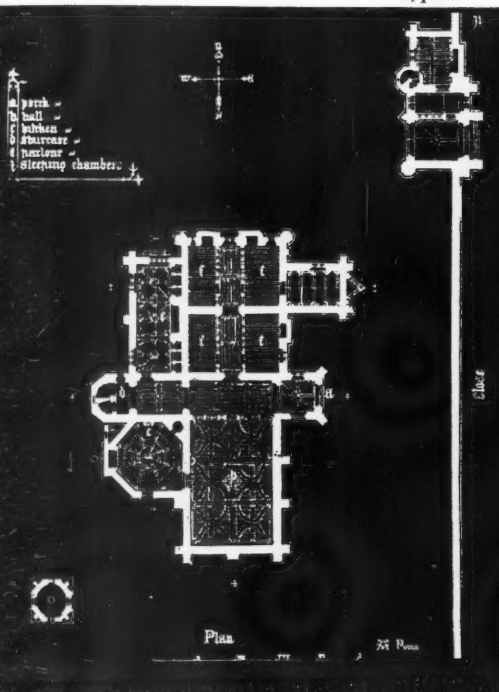
6, *cross section through kitchen, looking north*



7, *cross section through staircase, looking north*

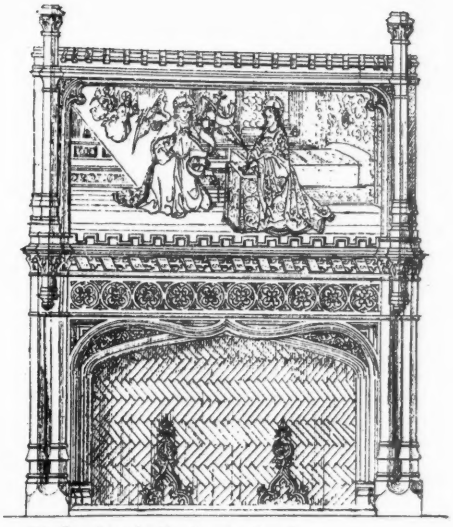


8, *longitudinal section through hall, looking east*

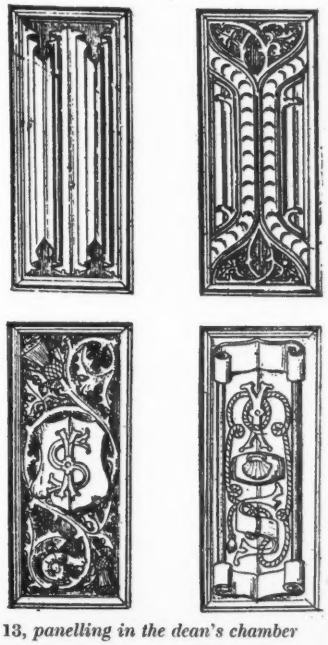


9, *plan*

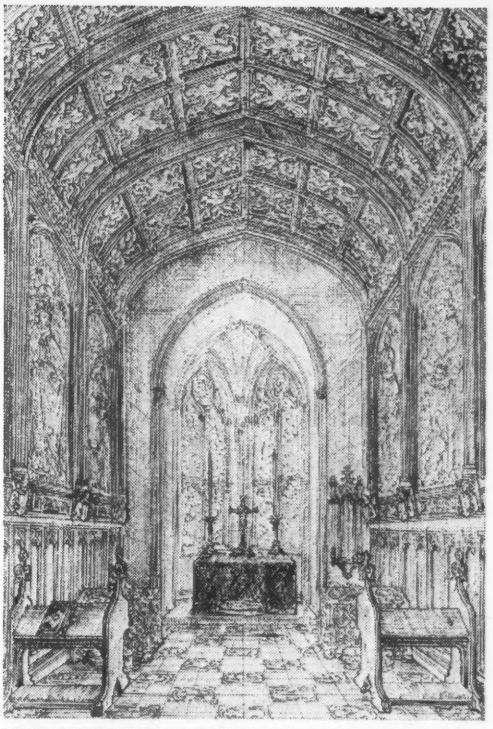
10, *north-east view*



12, *fireplace in the dean's chamber*



13, *panelling in the dean's chamber*



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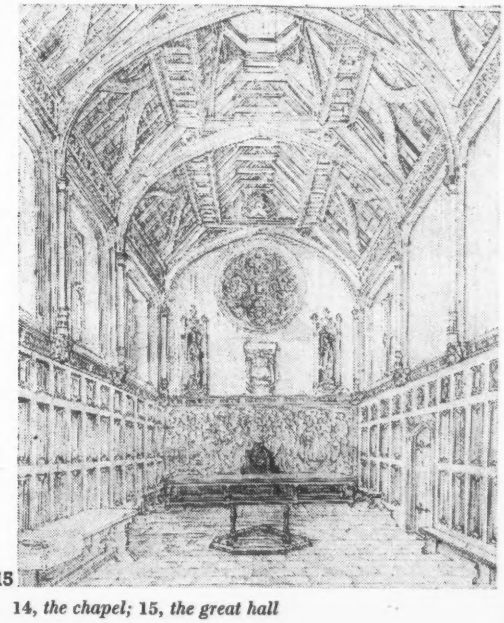


15

14, *the chapel;* 15, *the great hall*

chamber in the detail drawings. The perspective in the drawings of the elevation of the chapel and the louvre of the great hall is at fault.

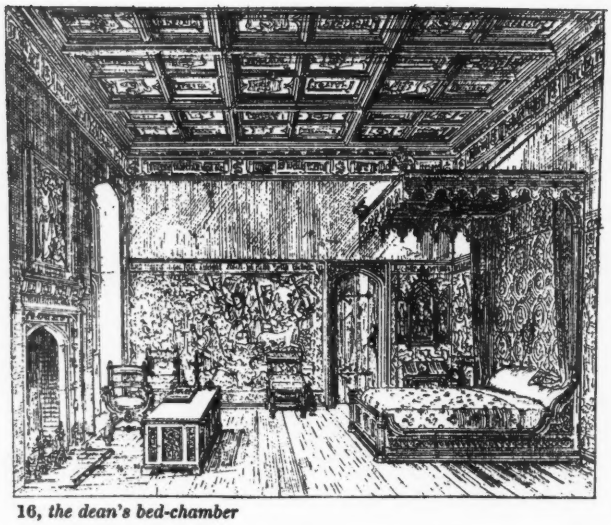
But these small peculiarities of design and draughtsmanship are far outweighed by the cheerful wilfulness with which Pugin modified the usual plan of the Tudor house. He kept the general pattern, great hall, separate private apartments for the family, and rooms for distinguished guests, but arranged them to give off a central corridor which on the first floor runs behind the screen of the great hall and provides a gallery, easy of access. The ground floor plan, kitchen, hall, parlour, small bedrooms, corridor and staircase, is conveniently arranged to separate the kitchen and make service to the hall easy. The first floor bays in the private rooms offer good light and an opportunity for crenellation and variety of roof line. This is a house to be lived in. It is also good to look at.

Pugin seems to have given the Deanery every Tudor ornament and architectural feature he knew about, providing his Deanery with decoration and features of which no single old house possesses more than three or four in any degree of refinement. There is an unstudied dignity about many of the old houses which Pugin could not duplicate. It may be that he did not intend to, but whatever his intention his building is a remarkable assembly of knowledge of fifteenth century domestic architecture. The Deanery is about eighty feet in length; the rough average for Tudor houses of this type seems to be somewhere between seventy and ninety feet in length. He knew, too, that local stone was favoured by the fifteenth century builders, but he combined it with narrow brick to relieve the monotony of texture and colour, a device also employed by old builders. The louvre is given in great detail, maybe because the hall has no oriel, and because an elaborate louvre was a rich decoration. The roof of the house is one of its greatest charms; for Pugin distributed the heraldic finials freely, ornamented the stair tower and the roof of the kitchen and grouped the chimney stacks perfectly.

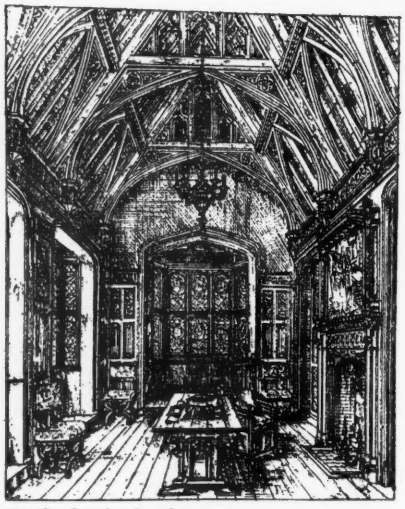
His treatment of the interior shows the same erudition. The great hall runs through ground and first floors, is entered from an opening in the screen, and the roof is open timber work, richly ornamented. All this was usual. The newel staircase he retained for it was the favourite of Tudor builders. The panelling, the joining and the designs, alternation of linenfold and other ornament, as in the panels over the bed in the guest room, are inspired by old models. The fireplaces are, however, Pugin's special love and they are tenderly drawn, imaginatively conceived with perfect understanding of the flat pointed four-centred arch in which they are set, and with comprehension of the scale of ornament in the spandrils and mouldings. There is authority for the tapestry of the Annunciation above the mantel in the Dean's chamber.

The furniture and tapestries seem to be treated with more chronological freedom than Pugin felt he could afford in the fabric and ornament of the house. The coffers in the Dean's bed-chamber, and in the chamber over the gate, are more heavily carved and the feet are more carefully shaped than was customary in the fifteenth century. The little Gothic stools in the parlour are, however, perfectly accurate. The tapestries with which the rooms are hung are quite in

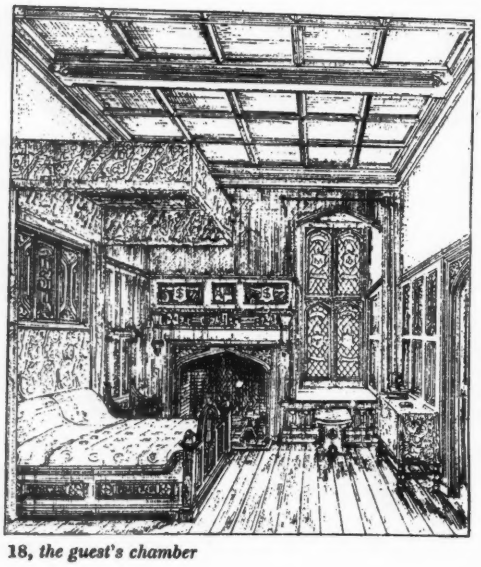
l, south-east view



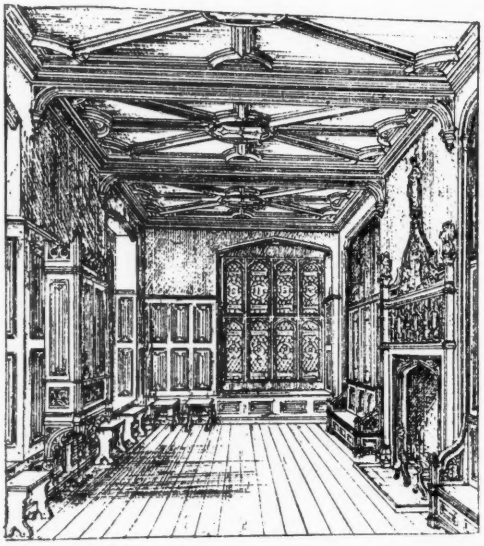
16, *the dean's bed-chamber*



17, *the dean's chamber*



18, *the guest's chamber*



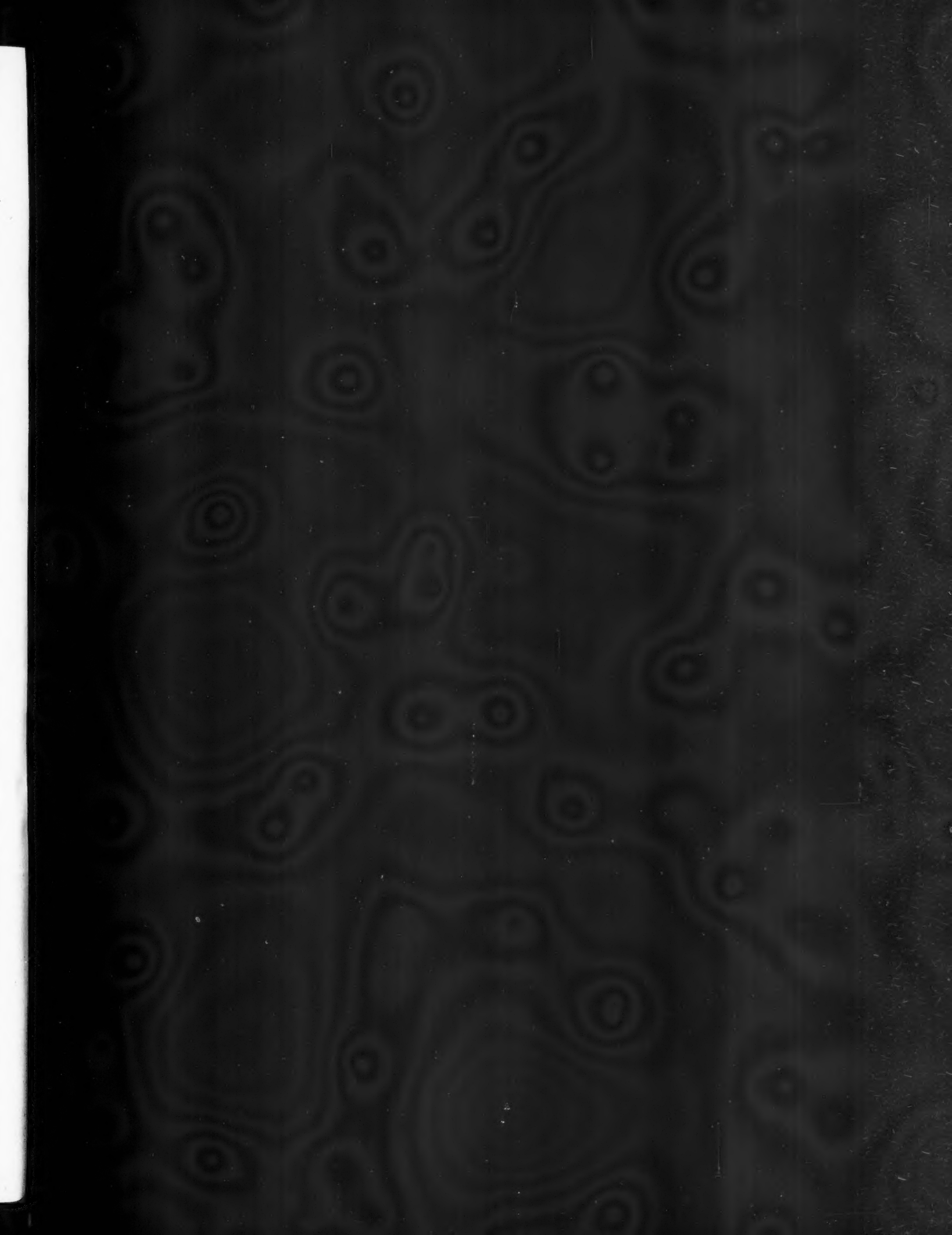
19, *the retiring chamber*

keeping; for such wall covering was popular in the richer homes. One wishes that some hint of the colour in these rooms were given. The dark painted ceiling, the embroidery of the upholstery, the tapestries, the heraldic glass, the painted wood of the furniture would have given Pugin leave to exercise his affection for colour and his instinctive ability to use it.

Twice in his tragic short life of frenetic activity Welby Pugin built a home for himself and his large family. St. Marie's Grange, Salisbury, and the Grange, Ramsgate, are reminiscent of this early design. Pugin would have liked to live in the Deanery. It seems the fate of anyone who studies Pugin to be infected by the contagious sympathy which the people who knew him felt. Each building he designed is in a sense a minor tragedy, for in no case was he able fully to realize his dream. Money, problems of craftsmanship, and finally the impossible task which he set himself, the revival of a beauty which really could not be revived, thwarted the valiant attempt which he made, and his own original genius suffered from the discipline of revivalism which he imposed on it. Nowhere is this more poignantly illustrated than when one compares the sparkling dream of the Deanery with his two homes—homes of a nineteenth century architect set upon by the hampering vagaries of professional income, personal problems, and religious conflict. Even so, however, both houses, Salisbury and Ramsgate, are comfortable and domestic; both, even after a century of wear and tear and alteration, still bear the mark of his personality. He had evidently an exceptional talent for domestic building. The rooms in the Deanery, for example, seem to be designed with the furniture in mind. At St. Marie's Grange the little first floor chapel, the newel stairs, the heraldic glass, the simple richness of the fireplaces, the puny reflection one gets of the gaily garnished roof of the Deanery, all are substitutes for the unattainable glories of the Deanery. At Ramsgate the ceiling of the living room, the glass, the more elaborate fireplaces, the little domestic chapel also suggest the Deanery, but with rather more opulence than did St. Marie's Grange. Small wonder that this little book was bound and preserved with his drawings even though, to the mature man who became a tortured perfectionist, some of the details of the plans must have seemed facile, the *tour de force* of a boy.

At twenty-one Pugin had made up his mind. He knew what he thought was beautiful and good and he had acquired the knowledge and the skill to do something about it. There is evidence that so far as domestic architecture went he did not change his style. The Deanery is the first of a series of buildings which were to decorate England and, for better or worse, breed thousands of imitations in the domestic Gothic style of the Victorian Revival.

Perhaps the most interesting revelation that these drawings make is that Pugin was simply incapable of pure archeological erudition. Gone from these designs are the barbaric heaviness of much early Tudor work. Left to his own devices Pugin created chimney stacks so refined as almost to be dainty and linenfold pattern of a lightness uncommon in real Tudor panelling. No motif which he utilizes is actually reproduced in all its heaviness, and, indeed, in all its native dignity. Even the noisy use of heraldry and owner's name is used with personal rather than archeological brilliance. Characteristic of Tudor building this house may be, but in the scale and density of its ornamentation and richness of colour it is emphatically Pugin. He used the mediæval as a point of departure rather than an end to be attained. Pugin was not able to make a faulty two-dimensional design, and whether or not one approves the method of a borrowed point of departure should make no difference in admiration of a genius for decorative pattern.



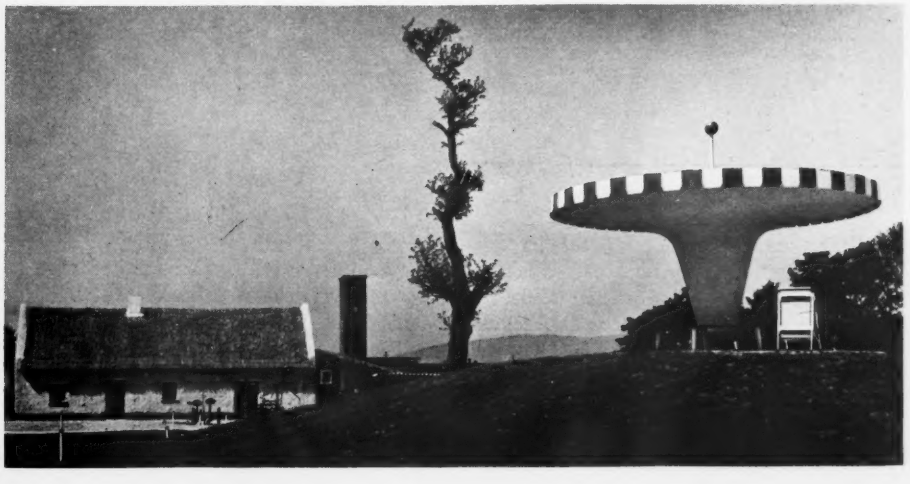
FOB exhibitions review

Because of its central position in London, its size and comprehensiveness, the South Bank Exhibition has tended to overshadow other events in the Festival of Britain. But in London and in many provincial centres are festival exhibitions, more modest in size, but which nevertheless deserve some permanent record. With the exception of the land and sea travelling exhibitions they have been organized locally, though often with the help of the Festival Office in London. The ten exhibitions illustrated here have been selected and commented on by Michael Farr.

1

BELFAST: ULSTER FARM AND FACTORY

The site of four acres at Castlereagh, Belfast, which was chosen for this exhibition, offered few advantages—some changes of level, 1, *a very few existing trees and an insignificant trench which was widened into a lagoon.* A new factory (architects: R. Ferguson and S. McIlveen) with 25,000 square feet of floor space was available for indoor displays. It has a north-light roof and a ceiling height of only twelve feet. A yellow and white striped velarium is stretched across the area and most of the displays are free-standing beneath it. For contrast and height variation a honeycomb timber frame is suspended over some sections. Of the displays, the Irish linen section, 2, page 192, is particularly well handled, and the whisky display, 5, is another which makes its impact by economy of statement and neat detailing. At the north end of the site is the Hillfoot Restaurant, with its outdoor terrace, 3. It is built of standard Bristol aluminium prefabricated units, amended in certain respects by H. Lynch-Robinson, painted



1

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1 *Belfast: Ulster Farm and Factory*

2 *Belfast: Modern Architecture*

3 *Glasgow: Industrial Power*

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5 *The Campania: British Land and People*

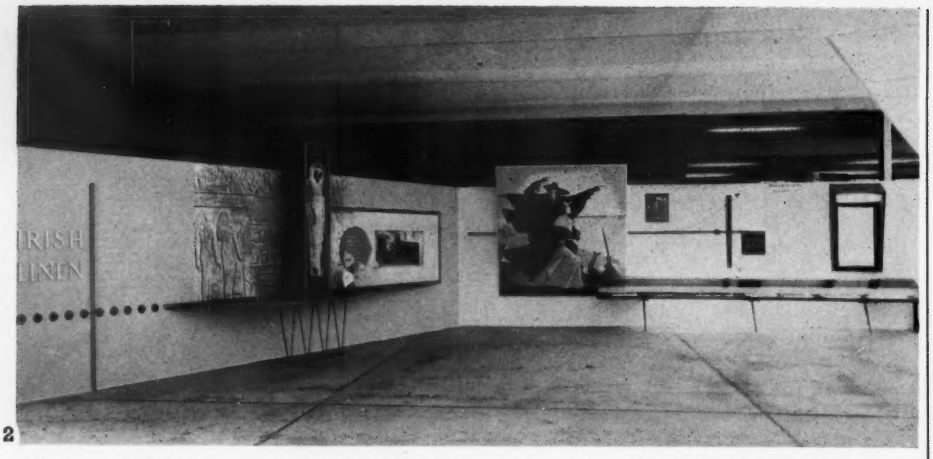
6 *Land Travelling: Industrial Design and Production*

7 *Kensington: Victoria & Albert Museum, Books*

8 *Poplar: Lansbury, Town Planning*

9 *Kensington: Science Museum, Science*

10 *Westminster: Royal Society of Arts, Exhibitions*



2

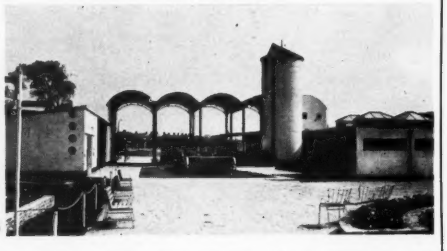
primrose and light grey outside and pale grey and blue inside. The ceiling is pink. Behind an old farmhouse near the main exhibition is a brick hut containing a bar on the rear wall of which is a mural, 4, by R. McF. Keers.

3

4

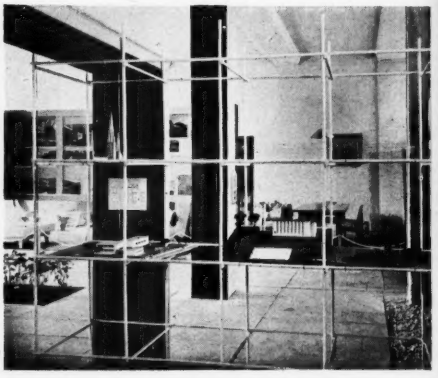
The main farmhouse and buildings have been designed by H. Lynch-Robinson to suit a typical Ulster holding of about 40 acres. Provision had to be made for arable farming, dairy cattle, pigs and poultry. A tall silo dominates the group, and the main buildings are connected with the implement shed and stores by the springing roof-line of a Dutch barn, 6. Though planned to save time and labour the buildings belong to a native agri-

5

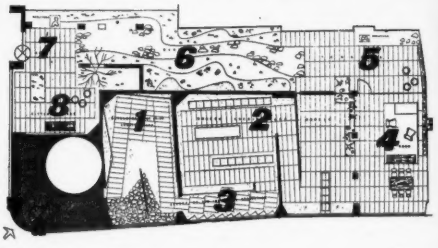

6

cultural tradition. This fact is further emphasized by whitewash and a tarred plinth which runs round all walls. Co-ordinating designer: W. M. de Majo. Landscape architect: H. Lynch-Robinson.

transitional exhibit showing some of the social and architectural effects of the industrial revolution. Beyond, the exhibition is concerned only with present and future architectural developments. Particular emphasis has been placed on a full-scale living-room, 8. By the use of one glazed wall, and the side wall at right-


7

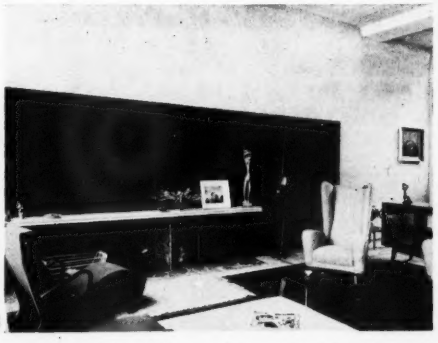
angles continued through the glass to the terrace garden beyond, with a surface finish of strong blue paintwork, the living-room is made to look larger, 10. The continuation of the shelf above the fireplace into the terrace in the same way creates the illusion of room and garden as one unit. Internal flower beds and concrete slabs following through the glazed wall into



key

1, development of Irish architecture. 2, modern architecture. 3, effect of the industrial revolution. 4, living room. 5, terrace. 6, garden. 7, exit. 8, sitting space.

the garden area are aids to the same end. The end wall of the terrace garden is

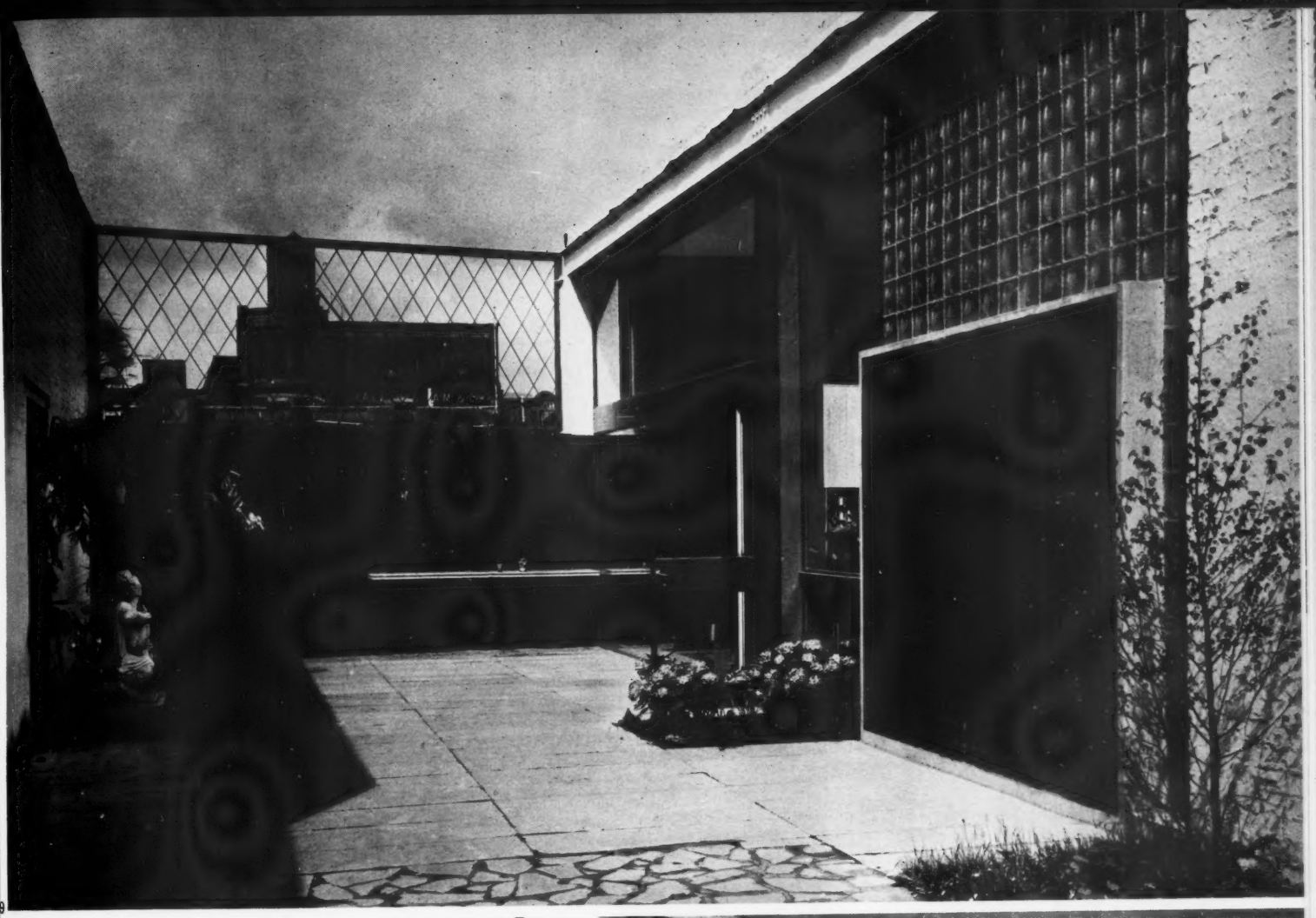

8

surmounted with a wide-meshed wire net screen, which frames the distant building. This netted vista is brought into the exhibition to serve almost as a mural, 9. The exhibition was designed by the Royal Society of Ulster Architects. The Exhibition Design Group Organiser is James V. T. Scott.

2

BELFAST: MODERN ARCHITECTURE

The aim here was to show how modern architecture can enrich the lives of Ulstermen. The exhibit is housed within the remaining ground floor of a blitzed building near the centre of Belfast. The first floor was made watertight to form the roof. Existing walls, augmented with temporary screens, were used to divide the area, which has been enlarged by various visual devices, 7. Floor surfaces are of alternating regular and irregular paving. In turn, these are divided by strips of loose gravel. After a brief historical section concerned mainly with architectural achievements in Ireland, the spectator passes through a



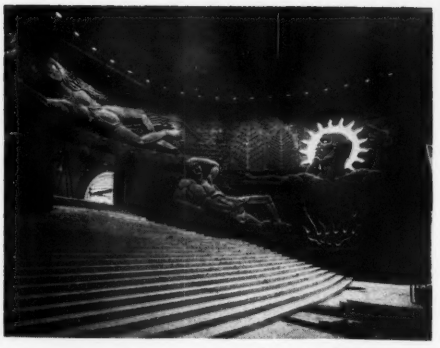
3

GLASGOW: INDUSTRIAL POWER

The subject presented is Britain's achievements in heavy engineering which have resulted from various applications of power. The two sources of power are coal and water, and they form the main sequences which lead off from the entrance Hall of Power. The spectator may choose either, for the circulation is planned on the figure of 8 with arms converging on a central, circular concourse.

Though Kelvin Hall has a total area of 200,000 square feet, the exhibition covers only 120,000 square feet. The main sections are enclosed by steel frame structures, with infilling of fireproof hardboard and studding. Over most of the area the height is limited to 30 feet, but in the centre bay (the Shipbuilding section) it extends to 35 feet. False ceilings of fireproof casement cloth are used. The scale of the display, particularly at the openings of the main sequences, has a massiveness considered appropriate to heavy industry.

The story of coal begins with an enormous bas-relief, by Thomas Whalen, 105 feet in length. It represents, on one side, the God of Nature arousing Man to his mission as a miner, 11, and on the other, the miner at work, 12. Beyond this the spectator enters a swamp: suggested



11

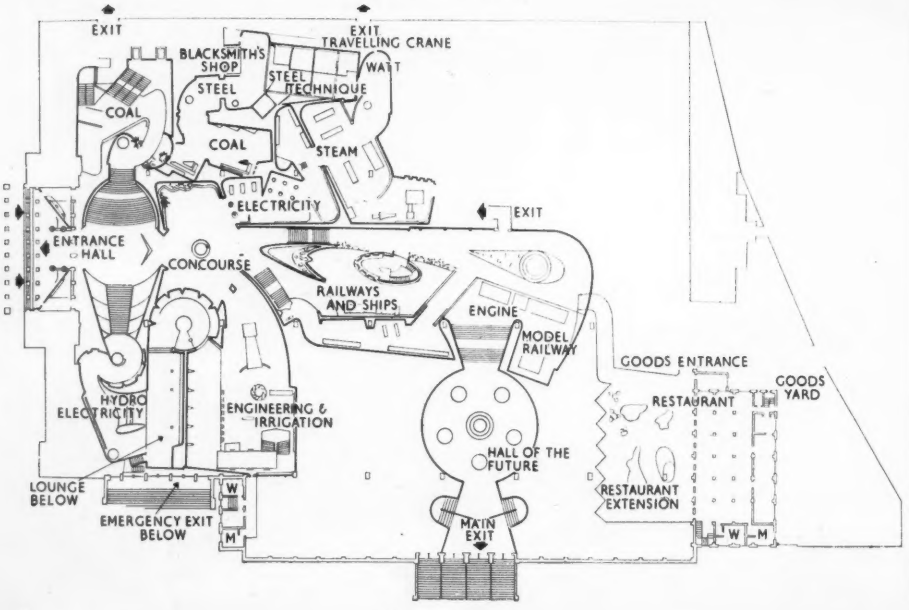
by primeval growths, dim lighting and sponge-rubber underfoot. Inside the Coal section, designed by Hulme Chadwick, there is a bas-relief showing the progress of men and women as miners, designed by Keith Godwin, reproduced on the cover. After this the spectator descends into a 'mine' from which he emerges into a high, brightly coloured structure with a sky-blue quilted ceiling cloth, where miners' welfare projects are displayed.

12

13

The entrance to the Steel section, designer Albert Smith, is panelled with sheets of stainless steel, and the floor is a mosaic of steel sections demonstrating various types of steel construction.

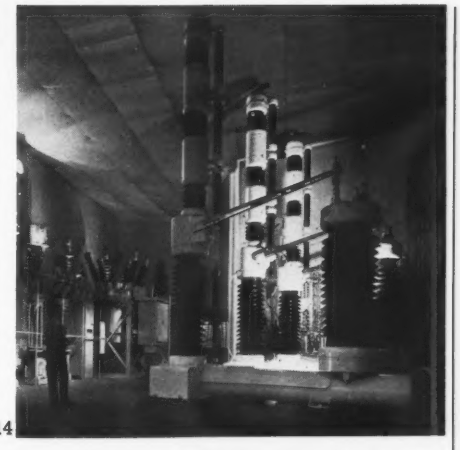
Throughout the exhibition particular emphasis is given to scientists and inventors like Watt, Trevithick, Faraday, Parsons and Rutherford. The end of the steel display is marked by a large portrait of James Watt, to introduce the story of steam power. A sense of spatial adventure is created here by curving galleries, cutaway machines, boilers and engines painted in purple, red and blue. A full-length portrait of Faraday announces the Electricity section, also designed by Albert Smith. The dominant colours used are pale ochre, blue and green. Generators, transformers and terminal bushings are here placed against simple backgrounds to emphasize their innate drama, 14.



A long glass tunnel over a staircase leads from the entrance hall to the water sequence; this is not entirely successful in design and there is certainly insufficient water to achieve the effect of untamed power that was apparently desired, 13. From the top of the stairs a series of curving walls faced with grey rough cut stone lead into the Hydro-electricity section. The designer was Arthur Braven. To the side of a long gallery there is a painstaking explanation of the effect of hydro-power on the Highlands under the heading 'Power-houses—Beauty or Blot?' Above is a string of novel lights in the shape of pylon terminals, 15, with, at the far end, a copper-foil sculpture of the Spirit of the Lochs. On the other side the gallery opens out with a wide view over the Civil Engineering section.

Civil Engineering, designed by Douglas Stephen, is approached by a side gallery and an asymmetrical staircase. The far wall is decorated with perforated sheet metal grilles in different designs and strong colours. The floor has a red and white chequered pattern. The roof consists of canvas panels in yellow, blue, green and red.

The section on shipbuilding and railways is less successful than the previous one on civil engineering; here, as in the rest of the exhibition, machines and tools when left to speak for themselves are more effective than any contrived display. In far too many cases in Kelvin Hall the artist has attempted to dramatize that which is already dramatic, and has only succeeded in creating an over-rich visual confection. The chief architect was Basil Spence.



14

15

manship are shown together, thus insisting on the dependence of one on the other. Large photo-murals of characteristic Scottish architecture are used to form backgrounds. Instead of the usual exhibition practice of employing strongly contrasting colours, the designers have produced tonal variations on a sunny yellow, so that the sections are defined, not by arbitrary labels, but by separate colour areas. In addition to this visual definition, the exhibition has been divided into two musical zones. In one a string orchestra plays traditional Lowland tunes,

16

while in the other seabirds are heard calling with the lonely, unaccompanied voice of a young girl singing Gaelic airs.

A replica of Sueno's stone from Forres, 23 feet tall, is the first thing to be seen on entering. Its size, and its ninth century carvings, suggest the traditional content of the exhibition. Flanking it on the right is a display of twentieth century architecture and craftwork. In 16, examples of pottery, tweeds, silver, glass, etc., are set out in an asymmetric arrangement of shallow alcoves and a curving showcase. The visitor looks down upon the exhibits in the section on contemporary furniture from a platform, 17. A semi-circular bay, forming the east end of the exhibition, represents a fishing village. Designers were Robert and Roger Nicholson.

4

EDINBURGH: LIVING TRADITIONS

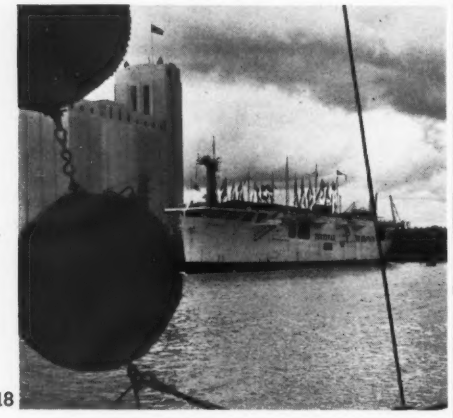
The Royal Scottish Museum at Edinburgh was chosen to house this exhibition of Scottish craftsmanship. Its lofty interior has been transformed into a long, low-ceilinged area. Fifteen sections, ranging from Celtic stones to contemporary architecture, have been fitted into an irregular plan which visually enlarges the space available. The strict chronology of a century by century arrangement, adopted by most exhibitions of this kind, has been effectively transgressed. In order to show off an inherent continuity in Scottish work the designers have put new and old examples of the various crafts adjacent to each other. Such juxtaposition brings out a new vitality in contemporary work. Again, pieces of Scottish architecture and crafts-

17

5

THE CAMPANIA: BRITISH LAND AND PEOPLE

The special problem here was to convert an escort aircraft-carrier to an exhibition ship. The bulk of the



18

exhibition is housed on the Hangar deck which is 300ft. by 70ft. Sufficient height, 24 ft., enabled galleries to be erected on this deck, so forming an extra level. The accommodation had to be rearranged for the exhibition's staff and ship's crew of 250 people. 18 shows the Campania moored up to a wharf in one of the ten towns which it is visiting on its coastal itinerary. Few structural alterations were made and the naturally clean lines of

19

20

the ship have been preserved. Where masts, handrails and stairways were added their design belongs to a traditional marine idiom.

The decoration of the Lord Nelson bar, 19, on the gallery deck, uses traditional pub techniques, particularly nautical ones, to solve some rather special requirements and in an attempt to overcome a very difficult plan. It was designed by Ernest Pollak who was, incidentally, one of the first prize winners of the REVIEW's pub competition, announced in June, 1950. The prevailing colour is a rich red, emphasized by the mural 'Coastal Craft' by Alan Sorrell. Bottles are used to decorate in the true pub tradition. The front of the robust wooden bar, 21, is laced round with thick marine rope: a decorative device still to be found in several quay-side pubs. At one end, 22, a public bar atmosphere has been created by using a plain, slatted table and jutting wall bench. The walls are faced with unstained tongued and grooved boarding. Let into the corner adjoining the mural is a familiar type of engraved brewer's mirror. At the other end is the Saloon bar, 20, with a slightly more sophisticated air expressed in the mural and in the upholstery. Note particularly the way in which the end wall mirror is used to enliven and enlarge the area.

22

The thematic story told by the South Bank Exhibition under the headings Land, Discovery and People is reproduced in the Campania on a miniature scale. In several cases the design and decorative treatment of the South Bank displays have been adopted and scaled down. This has resulted

21

in some unnecessary confusion. Leading round the displays is a carefully worked out circuit for visitors. The Hangar deck

23

is divided to accommodate the first and last sections of the exhibition. Rope rigging strung vertically from the roof enforces this main division where stairs lead to the overhead galleries. These in turn connect with the Flight deck where small craft are displayed. From here, and from the Café aft, the quay-side environment is joined visually with the exhibition. Below this

24

deck all is enclosed, for no glazing was possible. In the general display a nautical atmosphere is explicit, but it receives considered emphasis in such sections as Sea and Ships, 25, designed by Charles Hasler. Confinement has caused the comprehensive story to be unfolded rather hurriedly. But, it has also produced neat detailing and a pleasing intricacy that only occasionally lapses into fussiness. Most of the display is by photographs and scale models on simple steel stands. Changes in level are generally well handled, but the downward view from the galleries might have been more thoughtfully exploited. For the Land and Discovery, designers Victor Prus and Charles Hasler, colours are gay, chiefly yellow and bright red. A small section of

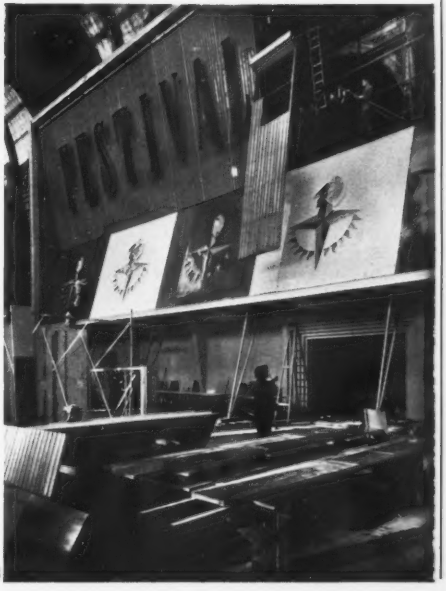
25

this, the Living World, can be seen in 24. In the People, designer Ernest Pollak, the keynote is intimacy, arrived at quite logically since the exhibits are much smaller. 23 shows a corner of the Rural Scene with pub ornaments displayed against wooden boards. The chief designer was James Holland.

6

LAND TRAVELLING: INDUSTRIAL DESIGN AND PRODUCTION

With an area of 35,000 *sq. ft. this is the largest transportable covered exhibition ever to be constructed.* It is



26

divided into large units to save time in transport and re-erection. The assembly of the entrance façade is seen in 26. The stands are on adjustable footings to take up the various levels on different sites. The minimum time required for dismantling, transportation and reassembly is 19 days. From May to September four provincial cities have been visited. The façade is 120 feet long and 50 feet high. It is faced with a laminated and corrugated translucent plastic.

The theme is industrial design and production. The story is told in five main sections—discovery and design, people at home, at play and at work and people travelling.

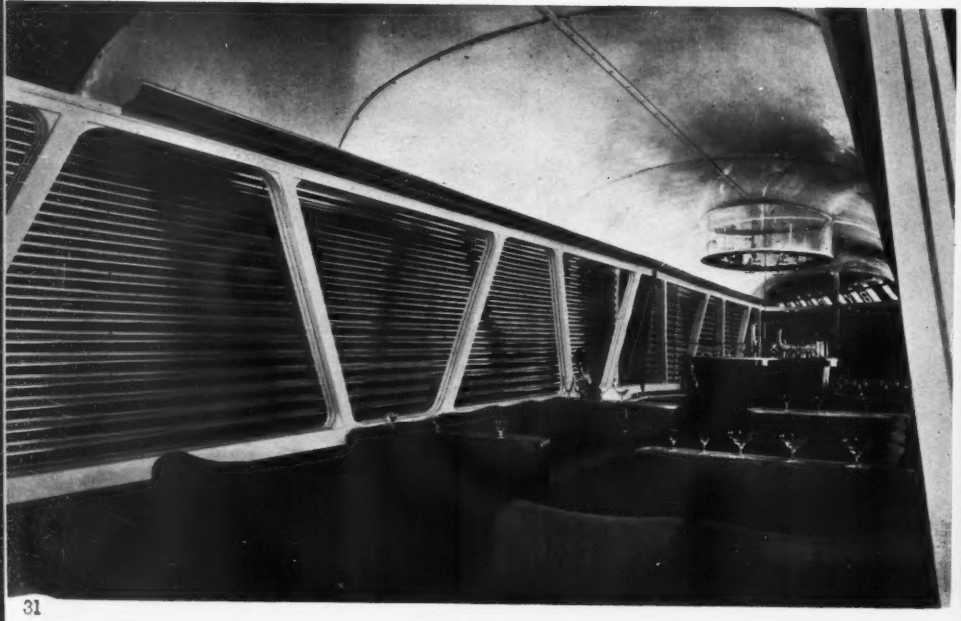
The People at Work section of the exhibition treats one single theme, the evolution and design of the Whittle gas turbine aero engine. 27, on the next page, shows the way in which the growth of the engine is presented, and in the distance a display describing some of the research work entailed. The sweeping wooden hand-

27

23

29

30



31

32

rail is supported by polished brass. The section was designed by H. A. Rothholz.

Invention, Discovery and Design section. designed by Manfred Reiss, is shown in 28. Its ceiling consists of thousands of yards of rayon, dyed to represent the complete spectrum range. A dimmer-switchboard may be controlled by spectators. The upright transparent plastic test tubes contain potted histories of various every-day articles—the hairbrush, spectacles, batteries, etc. The exhibits are suspended freely inside the tubes.

The People at Home section aims to show modern solutions to specific domestic problems—making the most of the small living-room, arranging for television and keeping warm. Offshoots such as the nursery, the bathroom and a kitchen, etc., are included. 29 is a garden-room in the house of the future, designed by Richard Maitland for James Cubitt & Partners. The hearth surround is of rough stone with wood and plain, predominantly white, colour finishes. Looking through the room to a recess, half full-size furniture models give the appearance of a living-room adjacent to the garden-room, divided only by sheet glass and garden plants. The flooring is of cement tiles. 30 shows a bed-sitting room for the business woman. The dominant colours are lime green with straw coloured wallpaper on the end wall. On the floor the carpet is dark blue with white spots, the ceiling is a smoky pink.

The People Travel section includes a specially designed railway observation car, 31, by Richard Levin, designer of the Devon Belle. It is divided by dual seats, running laterally, and separated by a central gangway opening in the rear to a cocktail bar with settees ranged along the sides. It has a laminated plastic sheet roof. On the left of 32 the coach is seen emerging from a tunnel. To the right of the same photograph is part of the air travel section.

33

The several thematic stories are suggested by the mural in the dome, of painted wooden slats, which was designed by Eleanor Esmond White. Ultra-violet lighting of the revolving 'clock hands' under the dome emphasizes this visual continuation of the introductory corridor of time. The chief designer was Richard Levin.

7

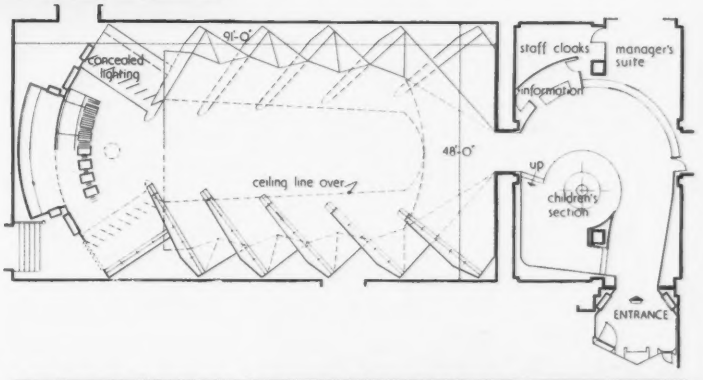
VICTORIA & ALBERT MUSEUM: BOOKS

Two galleries at the V & A house this exhibition of books. As they have been newly decorated, the exhibition structures could not be fixed to the walls. Instead, a rigid aluminium ceiling framework, 35 feet above the floor, supports the curving drapes of pleated

34

35

casement cloth, 34. With them the main display is enclosed. A 'backbone' plan was used with ten bays opening off a central gangway at varying angles to enable the subject-titles for each section to be picked out at the entrance of the exhibition. The children's section is an offshoot from the main circulation area and contains a circular 'Pepper's Ghost' feature in bright holiday colours, 35. The dominating quality is one of high seriousness, punctuated with devices of a more playful sort, such as the varied alphabetical transparencies fixed to the ceiling grid and the suspended 'quill' motifs in polished copper, 36. The designer was Hulme Chadwick.



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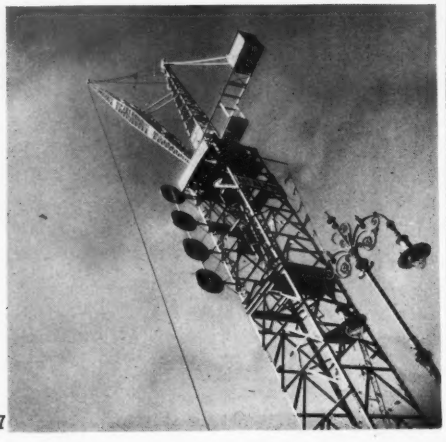
8

LANSBURY, POPLAR: TOWN PLANNING

The exhibition occupies a small corner of the Live Architecture Exhibition at Lansbury. A symbolic vertical feature is provided by a towering building crane, **37**. The exhibition consists of two pavilions: one deals with town planning, the other with building research. In addition there is *Gremlin Grange*, showing how *not* to build a house, and a café designed by Sadie Speight and Leonard Manasseh, called the Rosie Lee, **39**.



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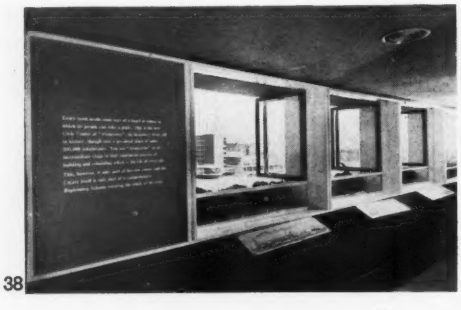
The Town Planning pavilion is a large tented structure supported on a frame of tubular scaffolding. In the entrance is a mural by Stephen Bone above a projecting rail with string infilling. Inside, the display comprises screens and models to show the social and architectural factors to be considered in new towns. The culminating point is the peepshow of 'Avoncaster,'

39

38, a hypothetical new town centre. The Building Research pavilion, designer John Ratcliff, is unusual in that its outside form illustrates the story told within. Separate bays deal with problems such as stability, rain penetration, heating, etc. The section on noise begins with a huge plaster ear surrounded by vertical wooden slats bevelled to form an interesting texture. In both pavilions wood has been well used, and the colouring is strong and arresting. The display designer was Ronald Avery. The site plan, **40**, placed at the roadside entrance, was designed by the



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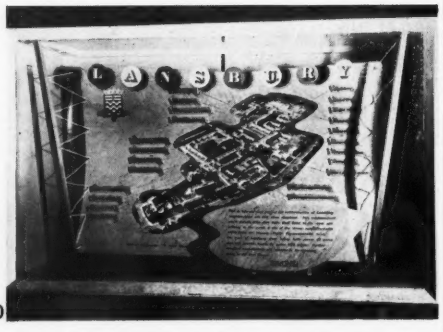

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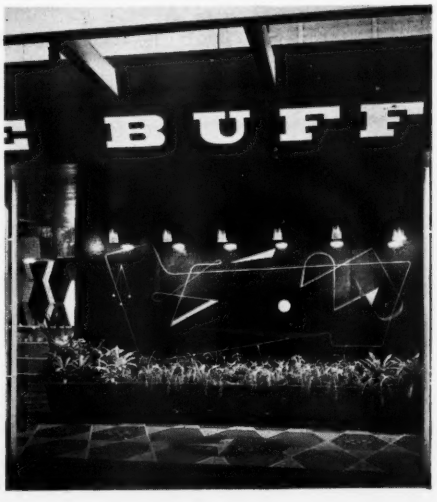
LCC Architect's Department. The co-ordinating architects were Hening and Chitty; technical co-ordinator J. Godfrey Gilbert. The landscape architect for the enclosure was Frank Clark.

white, pale blue and yellow screen of hexagonals, designed by Gordon Andrews. Above the narrow gateway shines a symbolic decoration in neon, against a dark blue background. The gateway, which has an intricate variety of textures, appears low to contrast with the spaciousness of the internal courtyard beyond. The screen of juxtaposed planes and contrasting surfaces along the face of the block, **42** and **43**, is of lemon coloured louvres and blue, pink and yellow boxes framed by tubular metal. Inside the exhibition, and looking down, the partitioned displays are visually integrated by a continuous vista of suspended hexagonal ceiling units, designed in Brian Peake's office. The pattern of these units is based on the structural atomic pattern of carbon and the lights themselves are formalized versions of nuclei joined together with clouds of electrons. The co-ordinating uniformity of this hexagonal grid is unexpectedly transgressed by the asymmetric gallery and the proportions of the more important displays, **46**. The designers of this work were Ronald Dickens and Eric Mansfield. An abstract mural by P. Hofel leads into the symmetrically planned cafeteria, **41** and **44**. The effective display lettering throughout the exhibition was the work of Gordon Andrews.

A separate feature of interest is the cinema by Brian Peake. The entrance, **47**, is flanked with a mural by G. R. Morris. The cinema is below the main floor and reached by a semi-circular staircase. Its foyer, **48**, has walls of lilac grey brickwork, punctuated by openings for rambling plants. The cinema itself, with a back projection screen, has a deeply recessed ceiling in parallel louvres and bamboo panelled walls.

All through the exhibition there is a neatness and precision of statement. Colours are bold and informative and greatly assist the explanation of a difficult subject. The chief designer was Brian Peake.



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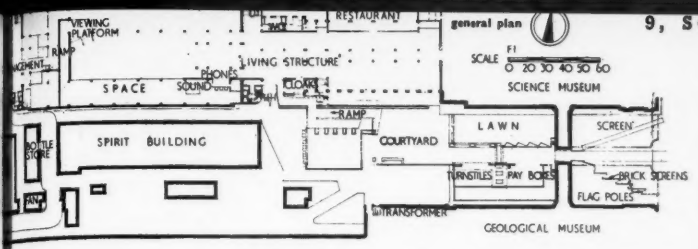
9

SCIENCE MUSEUM: SCIENCE

Set out in a new block of the Science Museum is a display of Britain's contribution to science, and especially to the study of nuclear fission. Though a new science block provided space and shelter for the exhibition, there were several problems to be overcome. No fixings or junctions were permitted anywhere and little internal plastering or painting was allowed. In addition to the exhibition itself the accommodation provided for a VIP suite, lavatories, a cloakroom and left luggage office, shops, first-aid post, cinema, and buffet restaurant, together with full office facilities for a large staff. The entrance is in Exhibition Road, **45**, where the main feature is a



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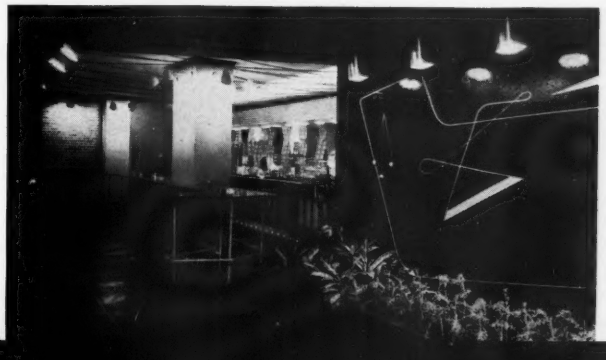
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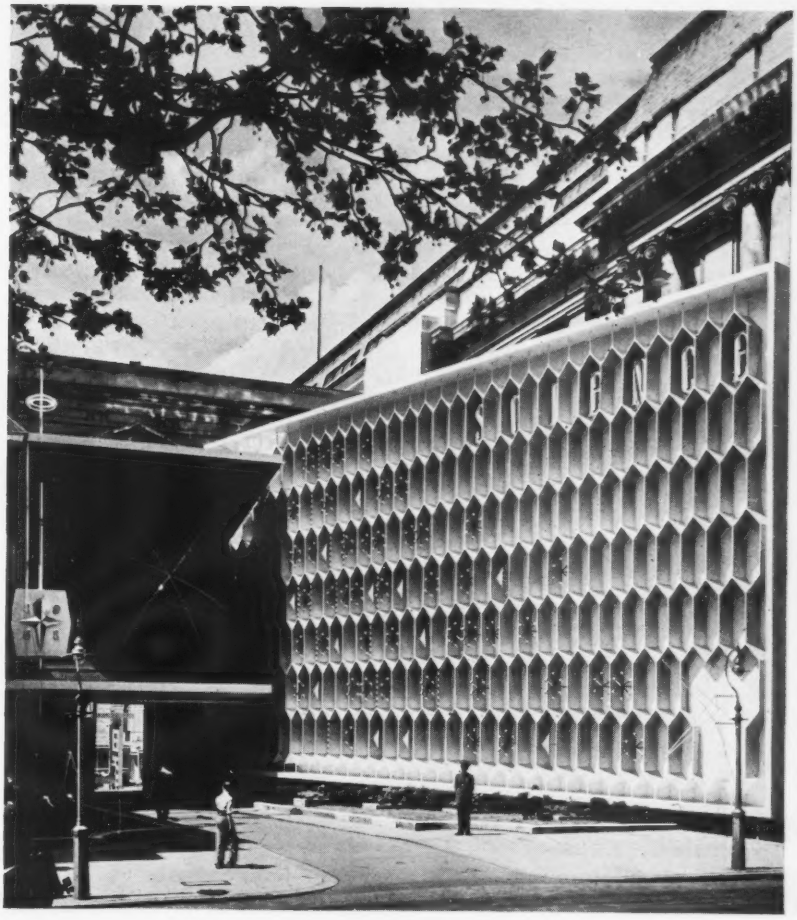

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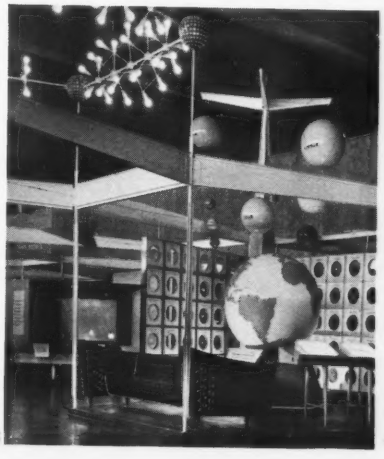
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10

ROYAL SOCIETY OF ARTS: EXHIBITIONS

This exhibition, held in the well-known lecture theatre of the Royal Society of Arts, is particularly remarkable for the way in which, instead of relegating to obscurity the famous Barry paintings it has used

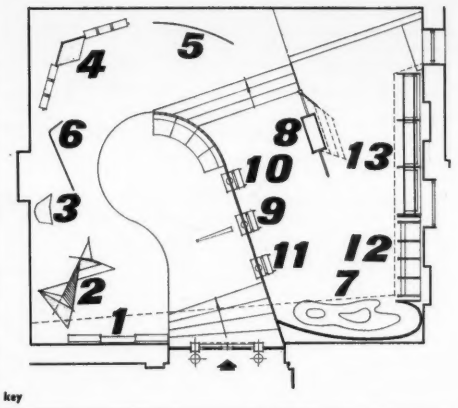
49

them to set itself off. As the subject-matter falls into two categories, the chief design problem was to subdivide the area into two sections and at the same time to overcome the stepped arrangement of the existing floor. A further condition was that the walls should not be used for fixing any display stands or materials. The theme is the Society's work in promoting exhibitions in this country beginning with the first public art exhibition, in 1760, from which developed the Royal Academy.

The first section, 49, deals with fine art and industrial design exhibitions; the latter extending from 1847 to the Design at Work exhibition in 1947. The second section, beginning on the lower level, describes the first industrial exhibition in 1761. The Great Exhibition in 1851 is illustrated with eight model groups by Lena Cooke of scenes based on Dickinson's lithographs. Adjacent to them, and illustrated with photographs and plans, are some of the important international exhibitions which followed. They extend from London in 1862 up to the New York World's Fair in 1939.

The existing pale blue panelling is used as background to displays in the first section, 52. The white tubular steel display units stand on sisal grass matting in fawn and deep crimson, 50. The hand-rail in mahogany with white metal supports marks, with a flowing curve, the edge of the high level. Other woods used are teak and beech with waxed finishes. Grey and red velvets surround the exhibits, and in the second section magenta and chrome yellow curtain materials are draped behind two of the stands.

The display has been handled with liveliness and imagination. This is

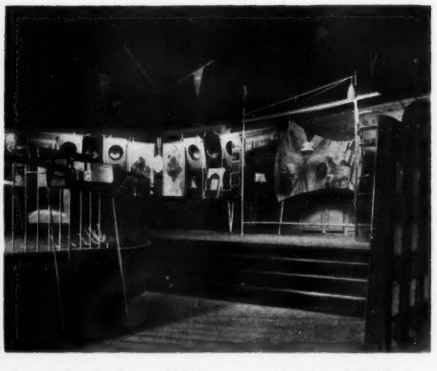


key

1, first public art exhibition, 1760. 2, from Society of Arts to Royal Academy. 3, first photographic exhibition. 4, first industrial design exhibition. 5, Exhibition of British Art in Industry, 1935, and Design at Work Exhibition, 1948. 6, Britain Can Make It Exhibition. 7, first industrial exhibition, 1761. 8—12, The Great Exhibition of 1851. 13, some international exhibitions since 1851.

51

especially true of the swing round from the high to the low level. The concept of the Crystal Palace is sketched in alumi-



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nium (not forgetting one of the Sibthorp elms. At every turn the effect is enriched by the shadowy figures on the wall above, 51. The designer was Hulme Chadwick.

50

BOOKS

SHARAWAGGI

CHINA AND THE GARDENS OF EUROPE IN THE EIGHTEENTH CENTURY. *By Osvald Sirén. 223 pp. and 208 plates (16 in colour) and numerous text illustrations, 4to. The Ronald Press Co., New York.* $30.

China haunted eighteenth century Europe. In 1756 Louis XV was persuaded by Mme. de Pompadour and her physiocratic friends to plough a furrow at the Spring solstice in imitation of the age-long fertility ritual performed annually by the Emperors of China. The garden theorists were, so they thought, just as deeply imbued with Chinese ideas as the physiocrats and believed that the European landscape garden was somehow inspired by oriental models. Unhappily only a handful of Europeans had ever seen the gardens of the Yüan Mëng Yüan and their descriptions were anything but lucid. When Sir William Chambers (who had visited China and should therefore have known) described Chinese gardens as containing 'caverns for the reception of crocodiles, enormous water serpents and other monsters' he let loose a controversy which is still unresolved. Horace Walpole, infuriated, hastened to declare that 'the imitation of Nature in Gardens is original and indisputably English' adding 'the Chinese have passed to one extremity of absurdity as the French and all antiquity advanced to the other . . . regular formality is the opposite point to fantastic Sharawadgis.' The decay which overtook most of the *jardins anglo-chinois* here and in France during the nineteenth century has made it almost impossible for us to judge the merits of the question.

It is one of the many virtues of Sirén's book that he is able to bring the original appearance of many of these gardens, with their now destroyed Chinese houses and Turkish tents, vividly before us by drawing on the mass of contemporary materials to be found in the Academy of Art at Stockholm. Most of these documents consist of water-colour drawings prepared by the Swedish garden architect F. M. Piper during a tour undertaken between 1772 and 1778, when he visited almost every modern garden in England and on the Continent. The same collection also contains a number of drawings for oriental garden features designed by the Frenchman J. L. Desprez and other artists summoned to Stockholm by Gustavus III to lay out the Royal Parks at Haga, Drottningholm and elsewhere. Many of these are reproduced in colour with great success. Their oriental-cum-rococo flavour and the general elegance of their design is charming, though whether the effect they produced was that aimed at by oriental gardeners is open to doubt.

But in spite of the title of his book Professor Sirén does not confine himself to discussing the Chinese element in European eighteenth century gardens. He gives a full and on the whole well-balanced account of its development in England, France and Sweden—though he does less than justice to Vanbrugh's position as a pioneer in this country. It is the Swedish gardens, a considerable number of which have survived in a much better state of preservation than elsewhere, which will be the least familiar to the reader. Numbers of Chinese houses still ornament the parks at Drottningholm, Grönsö and Sturefors while a bare half-dozen is all that remains in England and France—and even these have fallen now into a sorry state of disrepair.

China and the Gardens of Europe is perhaps the most sumptuous work of its kind issued since Le Rouge brought out the twenty-one volumes of his *Jardins Anglo-Chinois* in the late eighteenth century. For once the overworked phrase 'lavishly illustrated' is justified for the book contains more than a hundred large views of existing gardens mostly from excellent photographs taken by the author himself. There are an almost equal number of plates from contemporary drawings, many in colour, as well as numerous plans and engravings reproduced in the text itself. It is greatly to be hoped that this American monument to one of the foremost English contributions to the mainstream of European art will be issued over here by some enterprising publisher, for otherwise it is to be feared that the price of thirty U S dollars will make it a luxury that few libraries and fewer individuals are likely to be able to afford.

Francis Watson

CONCORDIA DISCORS

CHARLES RENNIE MACKINTOSH. *By Nikolaus Pevsner. Published by Il Balcone, Milan.*

With Mr. Pevsner's monograph the figure of Mackintosh acquires at last a precise historical contour, at the meeting point of two currents which are only apparently divergent; that which comes from Morris, strong in solid social arguments, and that which comes from Whistler and Godwin and keeps to the ideal of art for art's sake. Mackintosh's mind was formed at Glasgow in an atmosphere singularly favourable to the development of the ideas of the modern movement in æsthetics. The *concordia discors* of the fantastical with a strict stylistic rigour which constitutes the character of Mackintosh's architecture reflects that 'marriage of puritanism and sensuality,' which was in his character and in the social sphere in which he worked.

Mackintosh is a contemporary of Oscar Wilde, and there can be no question that the two reacted with equally acute sensitivity to the historical situation of the time. But it is also true that, though they move along two parallel roads, they move in opposite directions. Wilde searches in terms of pure, poetic form for a new and paradoxical morality to justify his rebellion against accepted conventions; Mackintosh tries to transform the useful into the beautiful, the practical into the poetic, the everyday surroundings of human life into a celestial harmony of lines and colours. Paradise on this earth, a shine of grace in the greyness of day-to-day existence, a ray of sun to transform dust into powdered gold (as in the paintings of Turner)—that is the ideal in which Mackintosh believed and which he tried to translate into reality in architecture. He tried, in other words, to achieve a dialectical synthesis between the two opposites of the spiritual and the practical; and one can easily understand how difficult and yet how urgent this task was in the bourgeois society of the nineteenth century, a society which was in itself torn between more and more overpowering practical jobs and ideal aspirations getting vaguer and vaguer until they nearly evaporated into mystical abstractions. Now what is important to observe in this situation is that, in connection with this very dialectical function, art began for the first time to get aware of its own autonomous, exclusive functions. To fulfil these functions art had to be pure art; for it is obvious that art cannot effectively influence social life and help in getting rid of outdated myths until art itself is firmly the expression of stability or of eternal values.

It is Mr. Pevsner's merit to have pointed out, in his memorable *Pioneers of the Modern Movement*, the social urgency which is hidden in the apparent restriction to art for art's sake of the æsthetes. This quality becomes palpable for the first time in Art Nouveau, which is, indeed, nothing but the attempt to endow with an æsthetic quality all acts of everyday existence. It affirms the unlimited circulation of art through all social spheres. Thus at the root of modern architectural functionalism, apart from research into the technical functions of new materials, and into the economical functions of new types of buildings, there is also research into æsthetic functions, and it is due only to this latter, if, instead of arriving at a dry technicism or mere utilitarianism, the modern movement has led to a true new style in architecture.

Mr. Pevsner has thus very rightly placed the chief accent in his lucid exposition of Mackintosh's buildings on his exceptional genius as a draughtsman. Mackintosh seems, indeed, all the time to transform images in his mind into structural facts. His structure is born on paper, not on the building site. Thus in his buildings the development of a line and the meeting of two colours acquire at once the values of relations of forces. With this disappearance of the usual intermediate technical stages, all distinction between decoration and construction disappears. What is achieved is functional decoration, something which comprises elements familiar from the traditions of painting and sculpture rather than from the traditions of architecture. This synthesis is doubtless one of the most 'modern' aspects of Mackintosh's architecture. And since with this abandon of traditional technical categories and this assertion of architecture as pure lyrics, the image frees itself from all relations to the usual spatial notions, it will be understood that motives and suggestions appear in Mackintosh's works which found their full development only much later by way of a radical revision of space-concepts and constructional methods. To realize this, it is sufficient to compare the interiors of the Glasgow School of Art with their complex interplay of beams, with the bolder spatial solutions of Frank Lloyd Wright in a project such as Midway Gardens (1914). Mr. Pevsner, at the end of his book, observes that in Mackintosh's free, yet rigorously controlled

'space fantasies,' spatial intuitions (by means of line and colour) are anticipated which only through Wright and Le Corbusier, Kandinsky and Picasso, Calder and Moore became part of the accepted language of modern art.

G. C. Argan

HEAVENLY SHELTER

THE DOME: A STUDY IN THE HISTORY OF IDEAS. *By E. Baldwin Smith. Princeton University Press: Geoffrey Cumberlege.* 48*s. net.*

The present tendency amongst historians of Early Christian architecture is to emphasize its development as the result of the spread of symbolic ideas rather than of the sudden mastery of technical processes. Professor Grabar's *Martyrium* (2 vols., Paris 1946) showed how the Greco-Roman *heröon* was adapted for use as a chapel for the cult of the martyrs and how the popularity of the cult led to the incorporation of these *martyria* into the buildings used for general Christian worship. Mr. Baldwin Smith's exhaustive study suggests the part played by the symbolism of the dome in this process. The dome, he says, is the primitive symbol of the heavenly shelter, and thus developed on the one hand into the 'cosmic tent' under which the Achaemenid kings and later Alexander the Great sat, and so into the canopy spread over the later Roman Emperors, and on the other into the form of roof suitable for the *heröon* and the *martyrium*. The *martyrium* developed into the type of church built in early Christian times in Syria and Palestine, which usually had a wooden dome. These wooden-domed churches evolved into the basilicas with masonry domes associated with the age of Justinian. Mr. Smith points out, with reason, that this evolution took place mainly in districts under the Patriarchate of Antioch, whose Church was particularly interested in such symbolism. He supports his argument with a detailed discussion of several churches, such as the Holy Sepulchre at Jerusalem and the Holy Apostles at Constantinople.

His thesis is on the whole convincing. It gives an answer to many problems of dating and of geography, and puts Islamic domed architecture into a proper perspective. The author's enthusiasm leads him into some overstatements. He is, perhaps, a little over-generous in giving a wooden dome to practically every early Christian church in Syria, and curiously quotes a passage in Procopius on the difficulty of finding timber for domes to prove that timber was available. He will not allow that any use was made of scoria, on the ground that so few traces remain, an argument that could be applied equally against the use of wood. He probably underrates the influence of the purely technical side of architecture; and, like all art-historians who depend mainly on written sources, he is apt to forget that many ancient writers were loose in their terminology, and therefore must not be interpreted too precisely. He himself is sometimes entangled in his own terminology, as, for instance, between 'cone' and 'dome.' Is a pine-cone domical and not conical? In so wide a study it is inevitable that some minor pieces of detailed evidence should be overlooked, such as a coin of Eudocia (published by M. Frolow) which suggests that the cross at Golgotha stood free without any roofing. At the end of the book there is an interesting discussion on the purpose of the Bema. The author's suggestion that it is a Place of Commemoration is plausible, but, as he says, the question needs further study from someone who is a specialist in the Syriac liturgy.

The book is excellently produced, apart from a few minor misprints, such as 'Simphronius' for 'Sophronius,' a misprint in the Greek on p. 34, and a false reference to the *Patria* on p. 33. It is a very important contribution to the study of Christian architecture.

Steven Runciman

NORWEGIAN TRADITION

NORWEGIAN ARCHITECTURE THROUGHOUT THE AGES. *Compiled by Eyvind Alnaes, Georg Eliassen, Reidar Lund, Arne Pedersen, Olav Platou; with an historic survey by Georg Eliassen; English text by Nicolai Geelmuyden. Published by H. Aschehoug & Co. (W. Nygaard), Oslo,* 1950. *Norwegian Kronor* 78.00.

This is an English version of *Norske Hus* and the result of the work of a secret committee of the Norwegian Association of Architects carried out during the German occupation. The original intention of the committee was to prepare an exhibition of Norwegian architecture to be held in London during the war, but owing to insurmountable difficulties the exhibition did not take place and the committee used the long evenings of the black-out instead to create this book. It is large and impressive, composed mainly of reproductions in photogravure, the concise text being a supplement to the illustrations. It covers the whole history of Norwegian architecture from eleventh century stave churches to timber houses of 1940, taking in such types as seventeenth century fortresses and eighteenth century farm buildings on the way.

The photographs and their reproduction are not always of first quality, and rather too many of the buildings shown seem to be insignificant. Nevertheless, the work does reveal that Norway has a surprisingly rich and vital architectural tradition compared with such countries as, say, Scotland and Ireland, whose geographical and economic conditions of isolation and poverty are roughly the same. That tradition is at its most remarkable in the indigenous and unique vernacular of wood right up to modern times. While the contemporary international movement has, of course, had its influence in Norway (particularly well rendered in such Oslo buildings as the Sentrum Cinema of Ove Bang and the flats of Blakstad and Munthe-Kaas) the Norwegian architect is at his best to-day when he is developing his own national functional tradition in timber as exemplified in the houses of Poulsson, Nilsen, Bang and Knutsen. They have that organic feeling. Those in search of the New Organic may find some inspiration in them, but probably far more in the illustrations of the old farmsteads and villages of the seventeenth and eighteenth centuries, where the walls are of solid tree trunks, the roofs are of sprouting turf and the clusters of barns and dwellings are beautifully composed and hug the slopes in spontaneous harmony.

This is a valuable contribution to a little known subject, the first comprehensive, illustrated history of Norwegian building, even though it is composed as much for the layman as the specialist, as much as a souvenir and a visual stimulus as a record. The compilers have done a thorough job in a commendable spirit of national pride.

Eric de Maré

Shorter Notices

LE CORBUSIER, 1938-46. *Edited by Willy Boesiger. Zurich: Editions Girsberger,* 1950. 38 *Swiss francs.*

This is a second edition of the most recent volume of the four-volume *oeuvre complète* of Le Corbusier, and is notable for having been enlarged and brought up to date to include his flats at Marseilles. This enormous structure is now nearing completion, and twenty pages are given to plans, technical illustrations and photographs of the work in progress. The great interest this project has aroused must justify the unusual course of including a partly finished building in the published collection of an architect's works. The progress of the Marseilles flats is being watched in many countries, as the test case for several of Le Corbusier's theories, and this publication provides most useful reference material. The publishers announce a fifth volume in the series, to appear in 1951, covering the years 1945-50, and this will presumably contain illustrations of the Marseilles flats in their finished state as well as other recent work, such as his method of analysing planning projects known as the CIAM *grilles* and his exposition of the principles involved in the design of the UN Secretariat in New York of which he was one of the consulting architects.

J.M.R.

WOODWORK IN YORK. *By J. B. Morrell. Batsford.* 30*s.*

The companion volume to Mr. Morrell's *York Monuments* which came out some two years ago. Like its predecessor the new book is very fully illustrated. Its two hundred-odd pictures range from half timbering to shop windows and chairs. The text is brief and engagingly unpretentious. It starts with extracts from mediæval documents concerning carpenters, joiners, etc., and their guild organization (of which uncommonly much is known at York), and goes on to descriptions of the ancient timber-built halls, street architecture, details external and internal, and furniture domestic and ecclesiastical. York possesses much fine woodwork, and therefore a strictly local survey is indeed of considerable national interest. The Merchant Adventurers' Hall of 1357-68 is the most notable early guild-hall in England, the Shambles one of the best preserved mediæval streets in the country, the late thirteenth century door into the Chapter House of the Cathedral an exquisite piece of High Gothic design, and so on. Of the post-reformation centuries there are equally rewarding examples of chimney-pieces (Gray's Court), door surrounds (Mansion House) and reredoses. If Mr. Morrell and his publishers are ready for more volumes, they can be assured that the public which has appreciated the present one and its predecessor is also ready.

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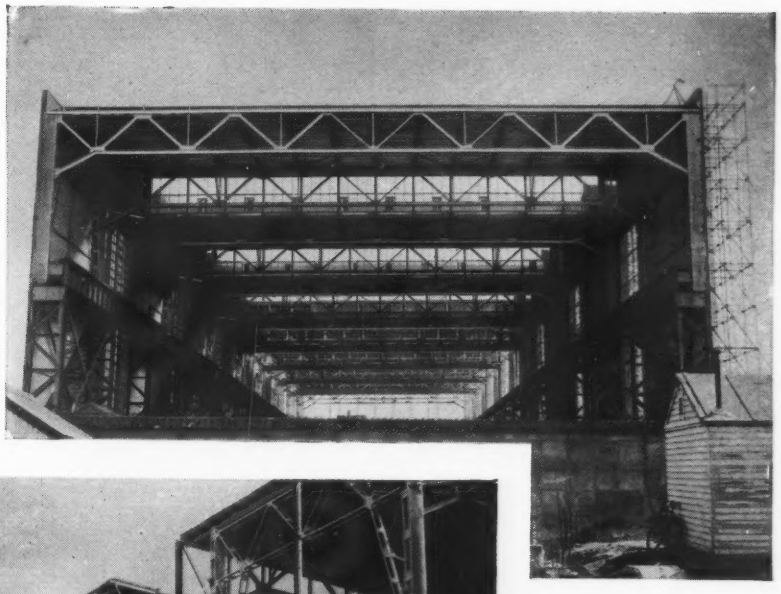

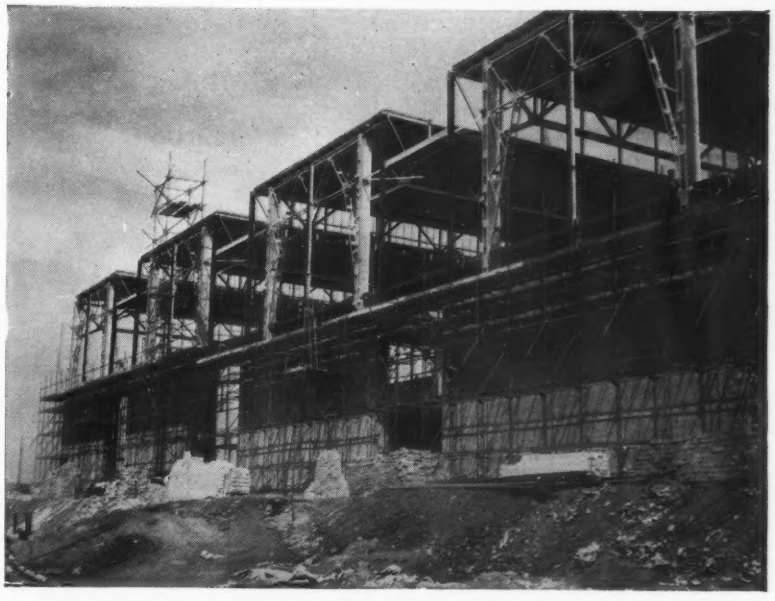

The cold Mill at Trostre
for the
Steel Company of Wales.
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Right. Drawers and door fronts of this delightful nursery furniture exhibited in the 'Child in the Home' feature of the Homes & Gardens Pavilion are in grey linette FORMICA.

Extreme Right. Self service counters, table tops, food display cases, back fittings and doors are veneered in grey linette FORMICA in the Thames-Side Restaurant.

ANTHOLOGY

Notes on Architectural Style

In what *Style of Architecture* shall you build your house? . . .

The architect himself will generally put this query to his client at the outset of their intercourses; and if the client be unlearned in such matters, he may be somewhat astonished to discover what it is he is invited to do. By the exercise of some instinct (or some caprice if it so pleases him, for the architect cares not which), he is expected to make a choice from amongst half-a-dozen prevailing 'styles,' all more or less antagonistic to each other, all having their respective adherents and opponents, and all proving to be more and more unintelligible the longer they are examined—the longer, that is to say, they are permitted to contradict each other.

The bewildered gentleman ventures to suggest that he wants only a simple comfortable house, in no style at all but the comfortable style, if there be one.

The architect of course agrees: but there are so many comfortable styles —they are all comfortable. Sir, you are paymaster, and must therefore be pattern-master; you choose the style of your house just as you choose the build of your hat; you can have Classical, either columnar or non-columnar, either arcuated or trabeated, either rural or civil, or indeed palatial; you can have Elizabethan in equal variety; Renaissance ditto; or (not to notice minor modes) Mediæval—the Gothic which is now so much the rage—in any one of its multifarious forms—of the eleventh century, twelfth century, thirteenth, fourteenth, whichever you please, feudalistic, monastic, scholastic, ecclesiastic, archæologistic, ecclesiologistic, and so on.

But really, I would much rather not. I want a plain, substantial, comfortable *Gentleman's House*; and, I beg leave to repeat, I don't want any style at all. I really would very much rather not have any; I dare say it would cost a great deal of money and I should very probably not like it. Look at myself; I am a man of very plain tastes; I am neither Classical nor Elizabethan—I believe I am not Renaissance, and I am sure I am not Mediæval—I belong neither to the eleventh century, nor to the twelfth, thirteenth or fourteenth—I am neither feudalistic, nor monastic, nor scholastic, nor ecclesiastic, neither archæologistic nor ecclesiologistic; I am very sorry but if you would kindly take me as I am, and build my house *in my own style* . . .

. . . Why cannot he (*a plain Englishman*) have a plain English house built for plain English occupation . . .?

The answer is to be found in the unprecedented degree to which the English public have lately become imbued (it will seem strange to say so) with the character of virtuosi. The statement will appear strange because, so thoroughly have we accepted the principle, and by such imperceptible degrees, that few may be able to imagine the possibility of its being anything like the innovation it is. But it is nevertheless the fact, for instance, that fifty years ago (even after two centuries of antiquarianism) the entire kingdom could not have clubbed together so much of this kind of knowledge, or half so much of its enthusiasm as go to the furnishing at the present day of one second-rate head out of a score that can be found in any county in England. We live in the era of *Omnium-Gatherum*; all the world's a museum, and men and women are its students. A very interesting state of things, and by no means to be lamented—quite the contrary; but it has its inconveniences, and amongst the rest this—that a gentleman has to be asked what style he will have his house built in. Why has not our age a style of its own, like all other ages? is the fashionable cry of contemptuous criticism. Our age, let it be again answered, has a very notable style of its own, and a very novel one; the style of this miscellaneous connoisseurship of ours—of yours, Messieurs Critics—the style of instinct superseded by learning—a state of things characteristic of our age as no other state of things could be characteristic of it—indicative of, not artistic incapacity surely, or anything else to be ashamed of—quite the opposite.

ROBERT KERR, FRIBA (*The Gentleman's House, Or How to Plan English Residences from the Parsonage to the Palace*). John Murray, 1864.

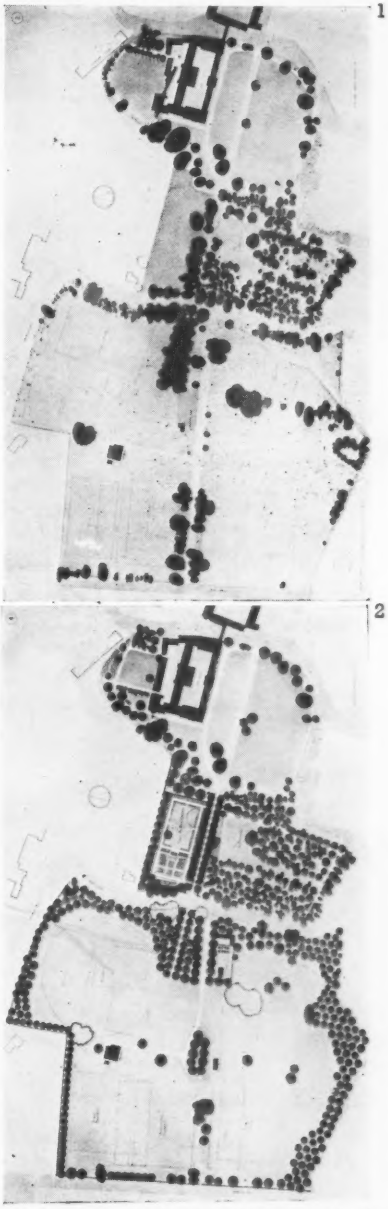
MARGINALIA

In Anthology

The extract from *The Gentleman's House* which is printed in Anthology this month may be read as a footnote to Robin Boyd's essay, *The New Eclecticism*. It will be noticed that Kerr, shrewd observer and analyst though he is, summons up in the last paragraph the spirit of High Victorian optimism to overcome any doubts he may have sown in the mind of his readers—or entertained himself—about the desirability of the kind of architectural situation in which they are placed.

Capabilities Realized

In engaging Thomas Sharp to design the replanting of its grounds, St. John's College, Cambridge, has carried on the tradition of a posi-



1, the present layout and planting of the grounds of St. John's College, Cambridge, and 2, the design for replanning and replanting by Dr. Thomas Sharp (*see* Capabilities Realized).

tive attitude to its surroundings that goes back to its employment of Capability Brown to lay out its Fellows' Garden (or Wilderness) in 1773*. Of the necessity for such replanting there can be no doubt: trees were continually being lost through decay, storm damage and elm disease, and no amount of *ad hoc* planting to fill gaps would have preserved the beauty of the grounds.

Dr. Sharp's scheme is shown above alongside a plan of the area as it was before work began. On the east side of the river the most notable addition is a new Fellows' Garden on the site of the orchard north of the Wilderness. This reintroduces an element of formality which was lost to this part of the grounds when Brown landscaped the old Fellows' Garden. (The orchard did not then belong to the college.) The Wilderness itself is substantially unchanged, while on the far side of the road the belt of trees to be planted round the playing fields and the clumping of the avenue may be seen as a modern application of Brownian principles. Future generations will have reason to be grateful to Dr. Sharp for his scheme, and to the present master and fellows of the college for their far-sightedness in adopting it.

Thomas Cole and Others

The catalogue of an exhibition organized by the Detroit Institute of Arts and the Toledo Museum of Art and held recently under the title 'Travelers in Arcadia: American Artists in Italy 1830–1875," has reached the REVIEW offices. One's first feelings on examining this substantial booklet of seventy pages on art paper may be best described as respectful envy—envy of a country where funds for so lavish a documentation of a temporary exhibition are available, and respect for those who have made such good use of them.

The period with which the exhibition dealt fell between that (1760–1830) in which London was the Mecca of American painters and that (lasting from 1870 until the present day) in which they flocked to Paris. Even in America most of the names involved are little known. As the introduction to the catalogue explains: 'The remembrance of these painters has been buried beneath the ruins of the reputation of the American sculptors who were then at work in Italy. The two Greenoughs, Thomas Crawford, Harriet Hosmer, Hiram Powers, Randolph Rogers, Joseph Mozier, W. W. Story, and many others, built up a vast but insecure edifice of fame which fell with a crash, sometime toward the close of the nineteenth century.' Against these practitioners of the smooth neo-classicism of the school of Thorwaldsen the organizers were able to set the painters Washington Allston (the first American romantic artist to visit Italy, staying there 1804–1808), Albert Bierstadt, George Loring Brown, John G. Chapman, Frederick E. Church, Thomas Cole, J. F. Cropsey, Sanford Robinson Gifford, W. S. Haseltine, G. P. A. Healy, George Inness, John Neagle, William Page, W. E. West (represented by a remarkable portrait of Shelley's friend Trelawny), and others of less note. On the evidence, Thomas Cole, who was introduced to REVIEW readers by Christopher Tunnard in December, 1948, was appreciably the most original of them. In contrast to the architectural fantasies with which Professor Tunnard's article chiefly dealt, one of Cole's straight landscapes, *The Roman Campagna* of 1843, is here reproduced.

*See Marcus Whiffen, *Academical Elysium: the Landscaping of the Cambridge Backs*, ARCH. REV., January 1947.

The Study of Science in Connection with Architecture

The RIBA Council have decided on an overhaul of the Institute's machinery for the study of scientific matters in connection with architecture and have decided to dissolve the present Architectural Science Board with its semi-autonomous and independent status, and in its place to constitute a Science Committee. This Committee will consist of a slightly smaller number of members who will meet more frequently and maintain closer relations with the Executive Committee and the Council by reporting on appropriate matters. The Science Committee will co-ordinate the activities of certain sub-committees entrusted with special tasks and it is hoped that the services of a number of distinguished non-members will still be available on the new Science Committee.

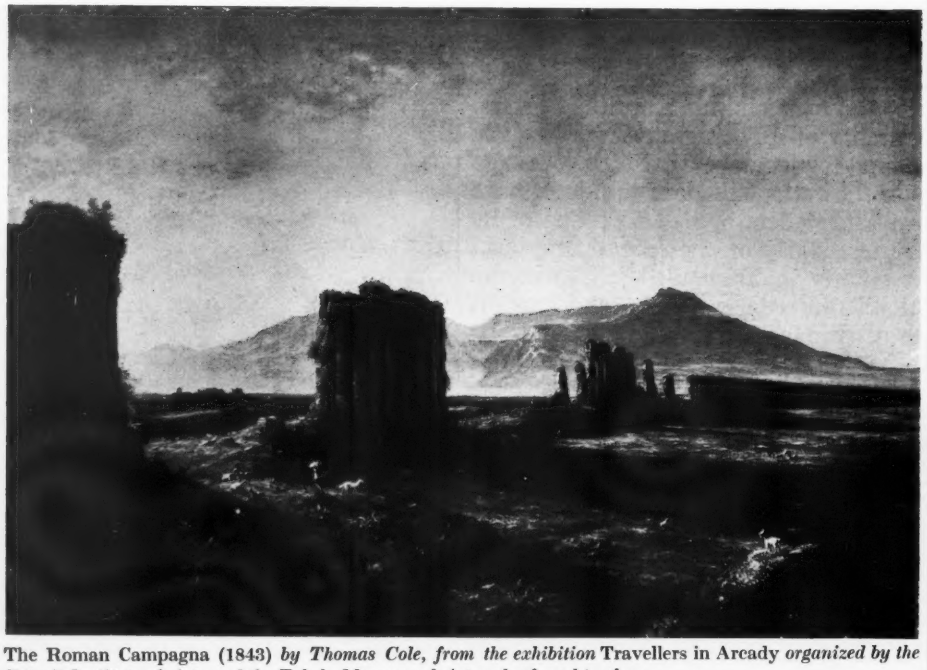
Contemporaries

Among the many journals that arrive in the REVIEW offices, three recent arrivals deserve a special welcome. One is the first number of *The Quarterly Journal of the Institute of Architects of Malaya*. Since the war the Institute of Architects of Malaya has been without a journal; its new publication promises to have a usefulness which should find it many readers outside the Colony.

The second specially welcome arrival is number two of *Ark*, the student production published from the Royal College of Art. Number one of *Ark* was noticed in Marginalia in January. This issue is a considerably more substantial affair than the first, and at the same time fully maintains the standard set by that both in appearance and in the quality of its literary contents. Contributors include Basil Ward, Robin Darwin and R. D. Russell.

The third to appear recently is the new magazine *Kontur*, published by the Swedish Society of Industrial Design. It is intended for the professional designer and to act in a complementary capacity to the Society's other magazine *Forum*, already well known as an excellent review of Swedish industrial design. This new magazine is well produced (with a four-page English summary and English translations of the captions to illustrations), the first issue containing articles, amongst others, by Gregor Paulsson, Henry Van de Velde and Max Bill.

3



The Roman Campagna (1843) *by Thomas Cole, from the exhibition* Travellers in Arcady *organized by the Detroit Institute of Arts and the Toledo Museum of Art and referred to above.*

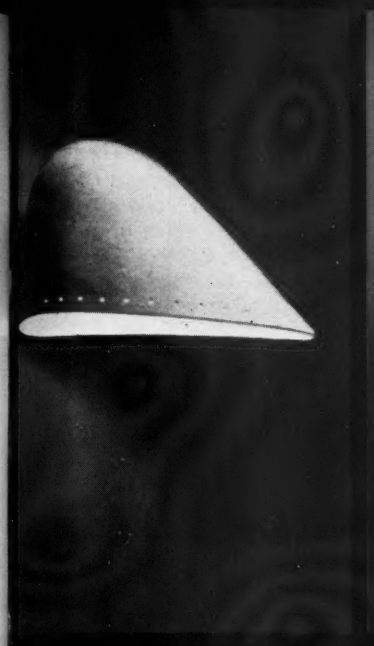
INTELLIGENCE

The Victoria and Albert Museum has completed the rearrangement of the Late Gothic and Renaissance Rooms, which contain works of art in all mediums, shown together in a consecutive series illustrating the history of style.

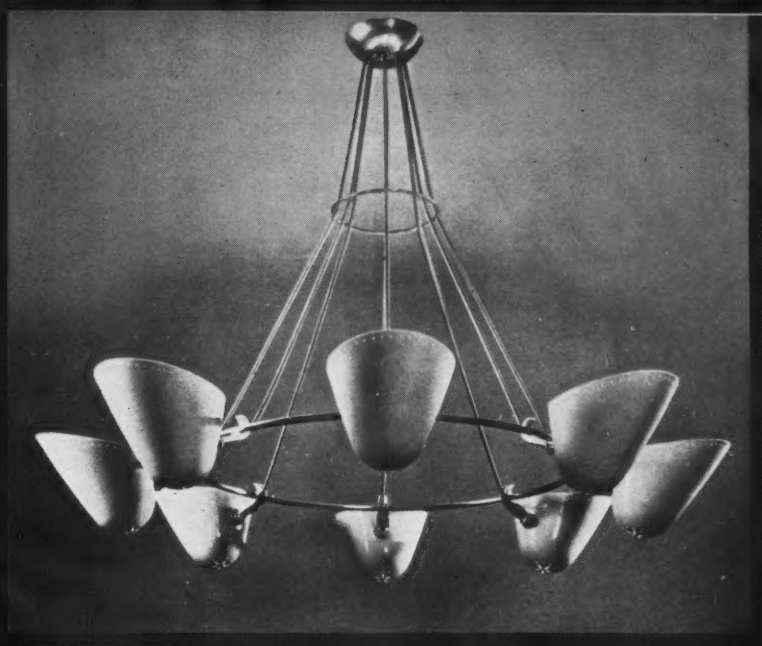
The British Council has published a handbook which gives details of some 70 scholarships offered by 15 foreign governments and universities to British students for the academic year 1951-52. The scholarships in most cases correspond to those offered by the British Council from these countries.

EXHIBITIONS

Those who went to the Hogarth exhibition organized by the Arts Council at the Tate expecting something comprehensive were disappointed: it comprised in fact something under sixty paintings and a baker's dozen of drawings and engravings. Perhaps this was an opportunity missed. Nevertheless, it was an exceedingly enjoyable show as far as it went,



R BRACKET. Fixed. Small metal reflector. reflector, off-white ; backplate, satin brass or satin m. Lamp : up to 60 watts.



FV. 118/R PENDANT. Eight-light ring with large metal reflectors. Finishes : reflectors and supports, off-white ; remainder, satin brass. Flexible cords, white. Lamps : up to 8 x 100 watts.

FV. 51/R BRACKET. Adjustable metal refle Finish : all off-white. Lamp : up to 150 watts.

The successful Versalite range of electric lighting fittings has been considerably extended and developed as a series to give maximum flexibility and adaptability for lighting the contemporary interior. All reflectors and shades in this new range may be turned at a touch to give directional lighting. Interchangeability of the various parts of these fittings has been made possible by large scale production to fine limits, and materials and finishes are of high standard. Illustrated here are some examples of the Versalite range. The complete range can be seen at the Lighting Centre in Knightsbridge, where you can also see our other ranges, Tubalux (fluorescent), Mondolite, and Ultralux.

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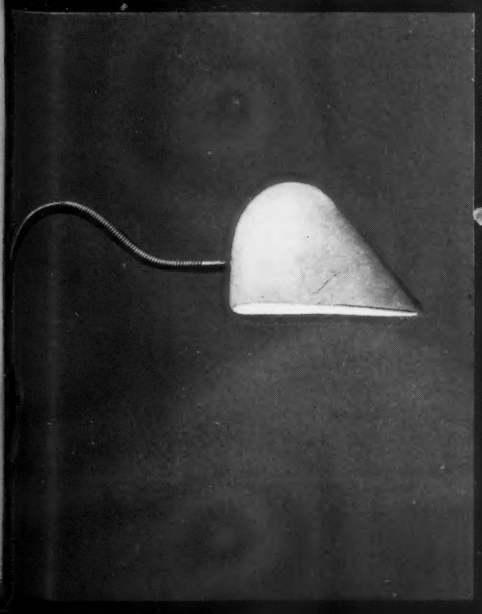
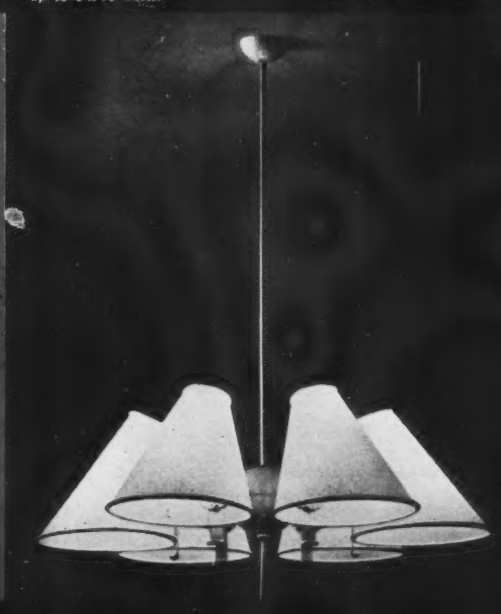
/R WALL BRACKET. Adjustable small unpierced metal finishes : reflector and backplate, off-white ; arm, lacquered brass; with switch. Lamp : up to 60 watts.



FV. 16/S PENDANT. Six-light. Shades with turning arms. Finishes : centre body and ceiling plate, off-white ; remainder, satin brass or satin chromium. Shades : ivory or peach plastic. Lamps : up to 6 x 75 watts.



FV. 2/R BRACKET. Adjustable arm. Large metal reflecto Finishes : reflector and backplate, off-white ; arm, satin brass or sat chromium. Complete with switch. Lamp : up to 100 watts.

Corset Department, Messrs. Selfridges of Oxford Street

EFFECTIVE display setting can interpret an atmosphere appropriate to the product; interpretation of design characterises the work of the George Parnall Organisation.

Messrs. Selfridges of Oxford Street, London, W., have completed certain re-planning of departments and it was the pleasure and privilege of George Parnall & Company Limited to carry out this work under the direction of the House Architect Mr. R. L. Heath, L.R.I.B.A., and Consulting Architect Mr. J. S. Beaumont, F.R.I.B.A.

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and represented all aspects of Hogarth's genius —the painter of portraits and conversation pieces rather better than the moralist. A welcome feature was the presence of six pictures from American collections. One of them, *The Wedding of Stephen Beckingham and Mary Cox* from the Metropolitan Museum of Art, New York, is reproduced on page 210.

The five paintings bought by the Arts Council out of those submitted by the sixty English painters invited to submit pictures in its Festival competition have already been reproduced in these pages. Recently they were on view at the RBA Galleries in Suffolk Street, together with the forty-nine other paintings actually submitted and eight of the twelve pieces of sculpture commissioned by the Council. (The other four of the last are on the South Bank and in Battersea Park.) The painters were invited to send in canvases measuring not less than 45 by 60 inches and left to choose their own subjects, with results as varied as any gallery-goer can imagine. Picking the runners-up to the five winners was anyone's game; this writer's selection would include Patrick Heron's *Christmas Eve* and Peter Lanyon's *Porthleven* on the modern side, and Roger de Grey's *The Open Window* on the traditional. (Of course that antithesis between 'modern' and 'traditional' doesn't hold water; but until someone invents, and gets accepted, a whole set of new terms for the relief of those who write about contemporary painting, it must be deemed to do so, at any rate for the duration of a sentence.) The sculptures included a carving by Bernard Meadows, an elegant construction in wood by Robert Adams, an iron group by Reg Butler, and a large mobile by Lynn Chadwick.

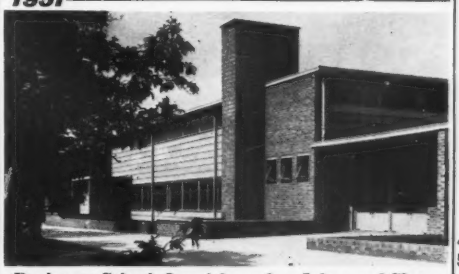
Yet a third Arts Council exhibition, the second of the two 'anthologies' of British painting between 1925 and 1951, has recently been seen in London, in the New Burlington Galleries. The paintings in this one were selected by Hugh Scrutton, Director of the Whitechapel Art Gallery, to represent those painters who (as Mr. Scrutton puts it in the introduction to the catalogue) 'move us through representation.' The three giants of the class, at least on the showing, were Sickert, John and Gertler; other painters included by groups of works were Graham Bell, Vanessa Bell, Coldstream, Coxon, Dodgson, Gillies, Ginner, Gowing, Grant, Leslie Hunter, Gwen John, Lamb, Le Bas, Morland Lewis, Moynihan, Napper, Sir William Nicholson, Pasmore, Potter, Rogers, Spear, Walker and Weight.

Two one-man shows of importance have been those of Graham Sutherland, at the Hanover Gallery, and of Maurice Utrillo, at the Marlborough. The Sutherland exhibition was of recent oils and water-colours, a score of each and none dating from earlier than 1949; chrysalis-like standing forms provided the *leitmotif*. The Utrillo exhibition likewise contained twenty oils, but only half of them were painted since the last war. Utrillo's latest paintings are often quite highly populated and have an almost Dufy-like gaiety of colour. But that unique synthesis of lyricism and monumentality which he achieved in such

The buildings on the left were all completed in 1851; those on the right have been selected from nineteen buildings granted the Festival of Britain 1951 award for meritorious design.

1851 **1951**

School at Hythe; arch., Joseph Messenger.



Rushmore School, Ipswich; archs., Johns and Slater.

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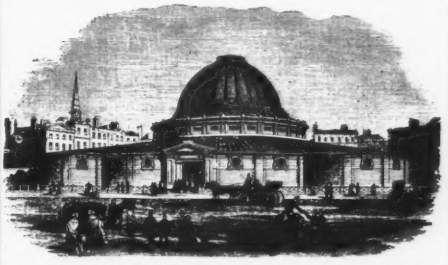

The Great Globe, Leicester Square; arch., James Wylde.

Underground Station, White City; arch., T. Bilbow.

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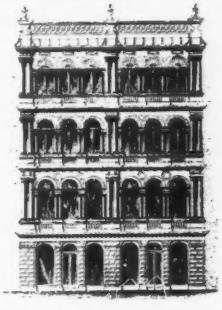
Shop, Market Street, Manchester; archs., Starkey and Cuffley.



Flats, Pimlico; archs., Powell and Moya.

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Billingsgate Market, London; arch., J. B. Bunning.

Steel Works, Scunthorpe; arch., Frederick Gibberd.

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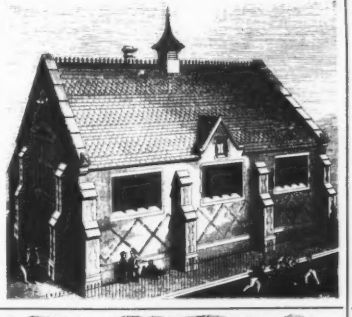
Sir Robert Peel's Grammar School, Tamworth; arch., Sidney Smirke.



Secondary School, Stevenage; archs., F. R. S. Yorke, E. Rosenberg, C. S. Mardall.

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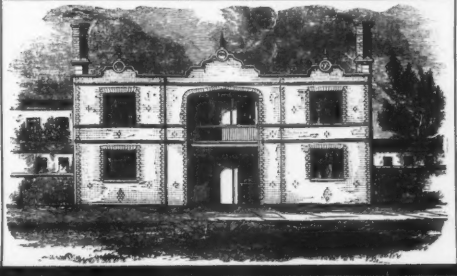

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earlier works as *La Chapelle Blanche* of 1911, reproduced here, is his no longer.

There were four more Utrillos, of the pre-1914 war period, in the Lefevre Gallery's School of Paris exhibition. This was a select and well hung show of forty-one pictures, ranging in date from 1896 (a Bonnard interior) to 1950 (Chagall, Leger, Hartung, and Schneider). One of the most impressive works was a *Baigneuses* of 1908 by Rouault, which suggested that that great expressionist in abandoning the third dimension for his 'stained glass' style in fact gave up one of the most powerful means of expression at his command.

Larger mixed shows, invaluable as picture sales, but suggesting no general conclusions to the critic, have included the summer exhibition of the Redfern and 'Artists of Fame and Promise' at the Leicester Galleries.

Corrections

In *English Staircases*, by E. F. Sekler, published in the May REVIEW, illustration 9 was the plan of an ideal castle taken from Francesco di Giorgio's *Trattato* and not of the Rocca di Mondavio.

The wall tiling in the school at Lansbury, Poplar, by Yorke, Rosenberg and Mardall, illustrated in the July issue, were attributed to Peggy Richards. They should have been described as being by Peggy Angus, the name under which the designer usually works. She is also designing tiles for other buildings by the same architects.

It is regretted that the name of the Borough Architect of Newport, Monmouthshire, some of whose housing work was illustrated in the July issue, was misspelt. It should have been given as S. Johnson Blackett.

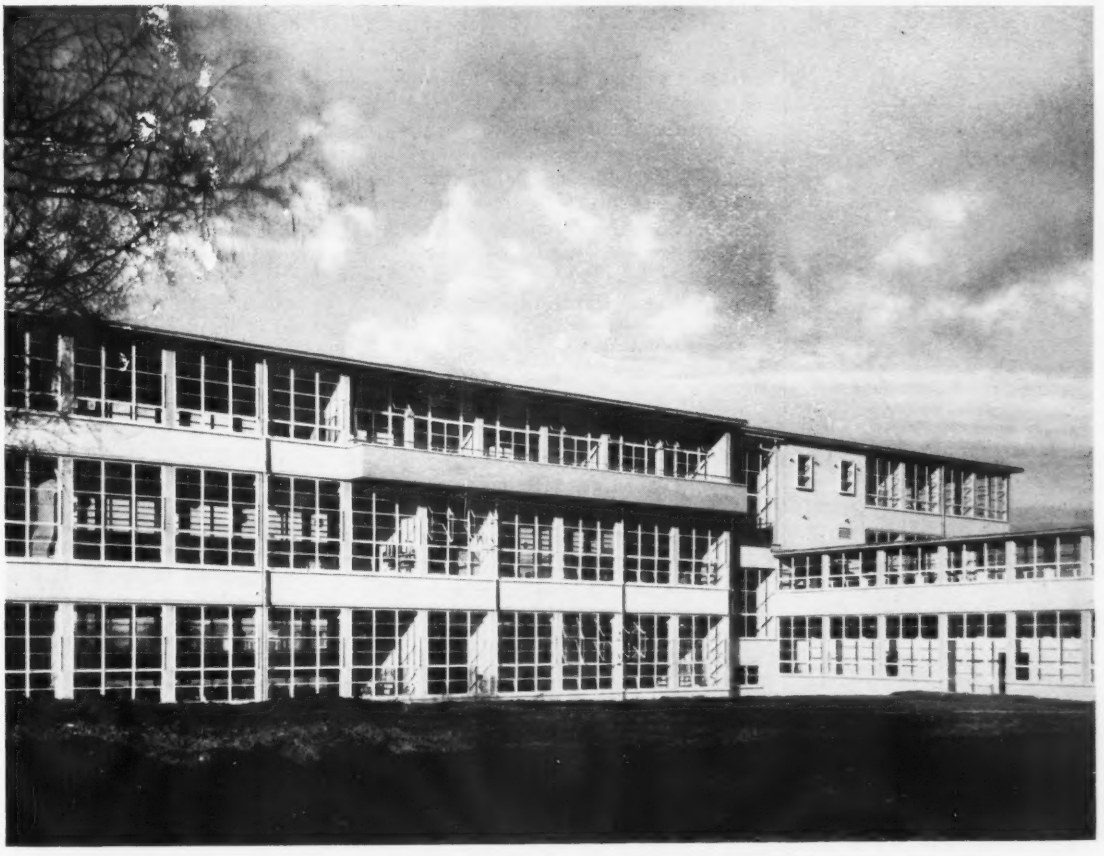
TRADE & INDUSTRY

Asbestos Cement at the South Bank

In an indoor exhibition that has to last a fortnight, designers and contractors can do almost anything with hardboard, three by two and distemper. But when the exhibition is out of doors, has to last six months and bear the weight of hundreds of visitors on two or three floors, it is a very different problem. Practically permanent structures are needed of materials that lend themselves to both the experimenting and imagination essential to good exhibition design and to good construction.

At the South Bank asbestos cement has lent itself ideally to this double purpose. The Power and Production Pavilion, the Homes and Gardens section, the Transport Pavilion, and the People of Britain Pavilion demonstrate the many uses of this material, while tucked away beneath the paving some 12 miles of 'Everite' asbestos-cement cable conduits serve a more hum-drum but essential function. 'Everite' asbestos-cement corrugated roof sheeting has been used for both roofs and walls in their standard form, either flat or curved, as in the

16, The Wedding of Stephen Beckingham to Mary Cox *by William Hogarth, from the Arts Council Exhibition at the Tate Gallery;* 17, La Chapelle Blanche *by Maurice Utrillo, from the exhibition at the Marlborough Gallery;* 18, Porthleven *by Peter Lanyon, and* 20, Christmas Eve *by Patric Heron from the Arts Council Exhibition at the RBA Galleries;* 19, Three Standing Forms in a Garden *from the Graham Sutherland Exhibition at the Hanover Gallery.*



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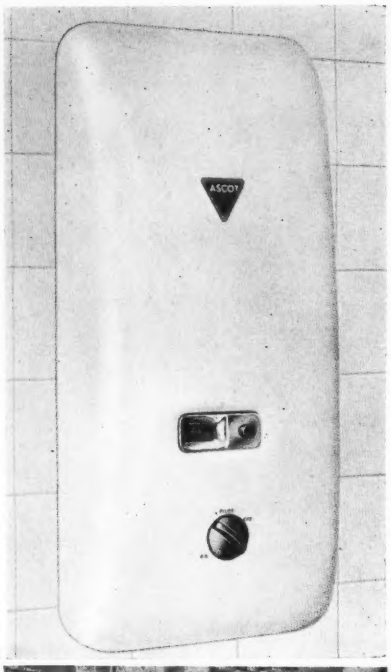

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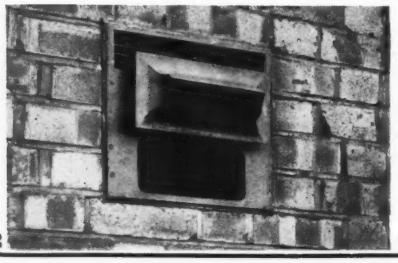

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Homes and Gardens building. Many special shapes have been moulded such as those in the Power and Production Pavilion, designed to accommodate the ventilation fans, and those for the pilasters which form the external side joints on the County Hall side.

In the Transport Pavilion two interesting features are the use of 'Poilite' flat asbestos-cement sheets fitted into glazing bars and painted, which have been used for cladding the rear and side walls, and of an asbestos-cement rainwater trough and trunking which completely frames the north façade.

There are besides many other interesting uses of this material, which the observant will spot throughout the South Bank.

Turners' Asbestos Cement Co., Ltd., Trafford Park, Manchester.

Balanced Flue Gas Water Heater

One of the most interesting processes in the history of modern industry, at least to a layman, has been the continued and spirited reaction of the gas industry to the development of electricity. A challenge which at one time suggested that the end of gas might be at hand has instead been answered by a spate of inventiveness and vitality which must be almost unparalleled.

The Ascot Company, one of the undoubted leaders in this industry, has just announced a new technical achievement, the Balanced Flue Gas Water Heater, which is almost as big a step ahead of its predecessor as the original multi-point was over the geyser.

21, the new Ascot Multipoint Gas Water Heater which is built into the wall. 22, shows the inlet and outlet flue on the outside wall.

This new water heater incorporates a system by which air for combustion is drawn from outside the building in which it is fitted, instead of from within. This is an entirely new principle. It enables the whole air and gas system to be sealed off from the living accommodation. The water heater is built into the outside wall, and a unique type of inlet and outlet flue is fitted behind it. This results in a far neater piece of equipment than has before been possible; it projects only 5 inches into the room, and measures only 31 inches high by 15¾ inches wide.

The two biggest problems were to prevent the recirculation of flue gases due to changes in wind direction, and eliminate the effects of unstable pressures caused by eddies of constantly changing wind velocity and composition. Since local changes of air pressure of the order of .007 inches water gauge would make the heater unworkable, some idea wil be obtained of the care and research necessary in the design of the flue terminal. Many years of experience and experiment in hydraulics, aerodynamics and pneumatics were necessary before this problem was overcome.

Ascot Gas Water Heaters Ltd., 43, Park Street, W.1.

Correction

In the June issue, on page 405, under the heading *Sub-Contractors: Structural Finish*, Messrs. Campbell Denis are quoted as being responsible for '*Fabrilath* grids for fibrous plaster.' This should have read: 'bracketing and lathing.'

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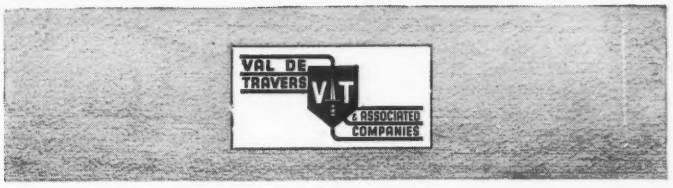

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[continued on page 214

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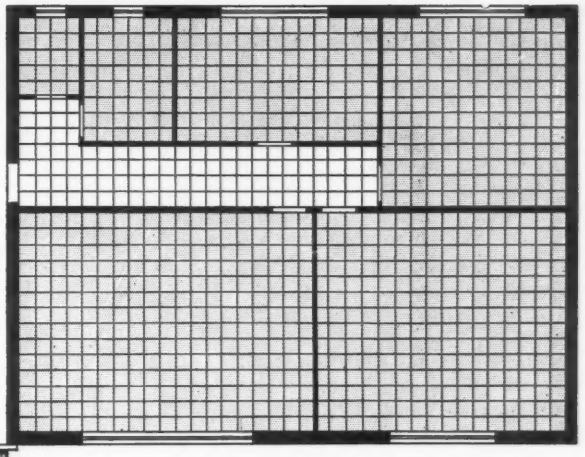

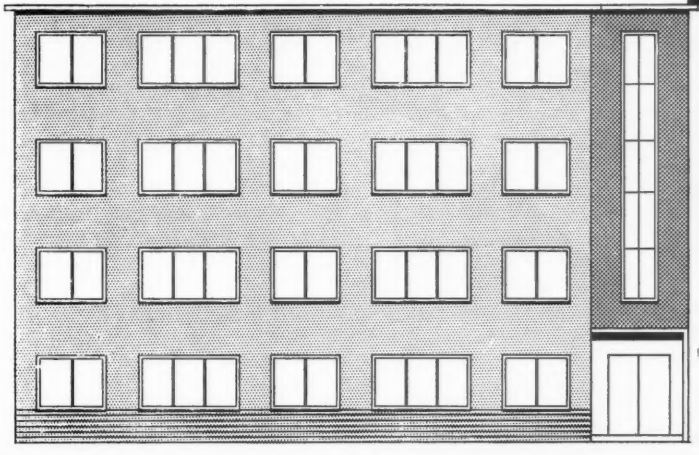

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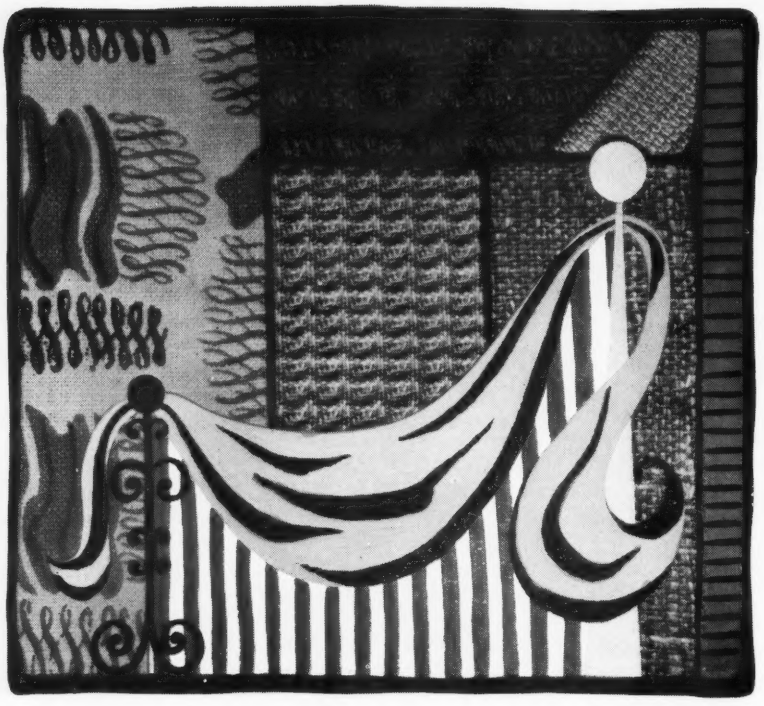

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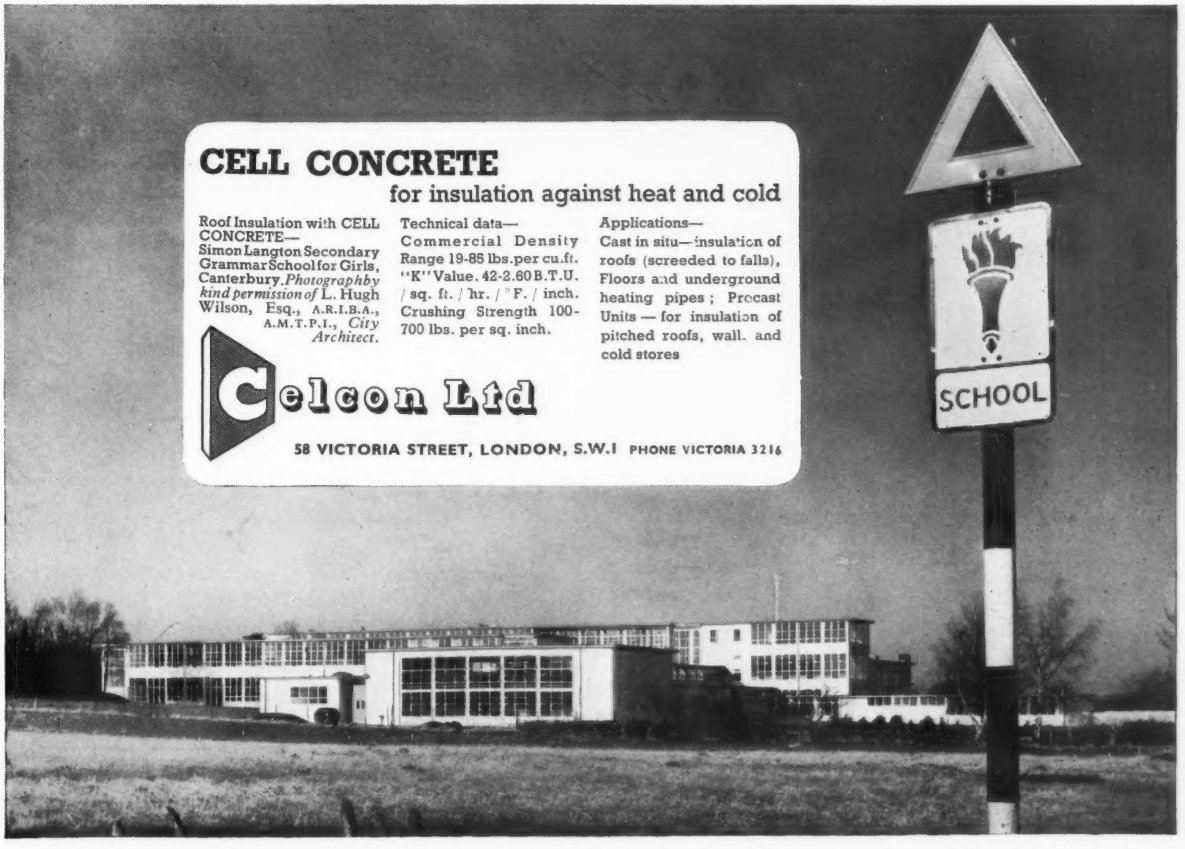

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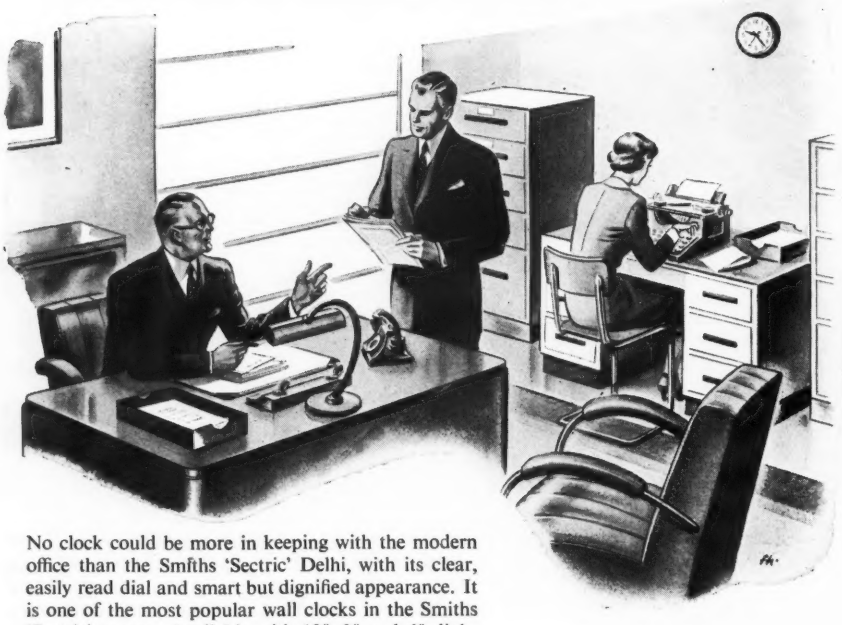

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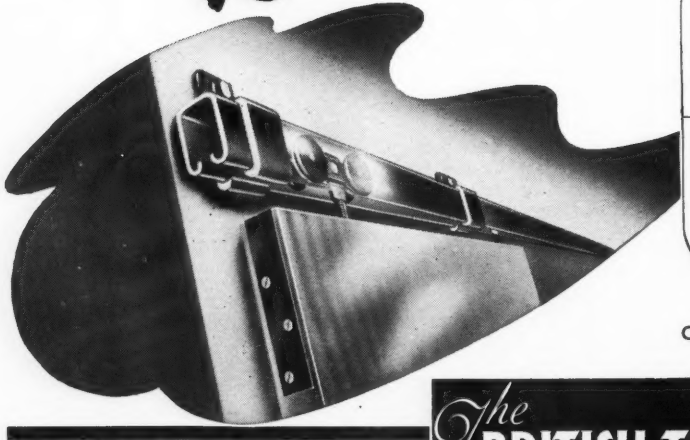

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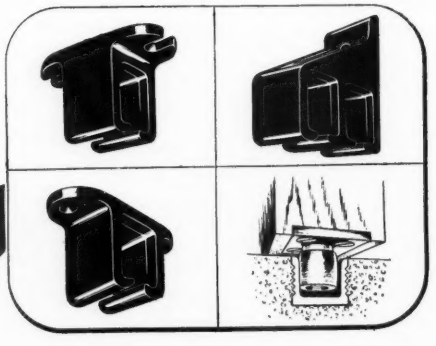

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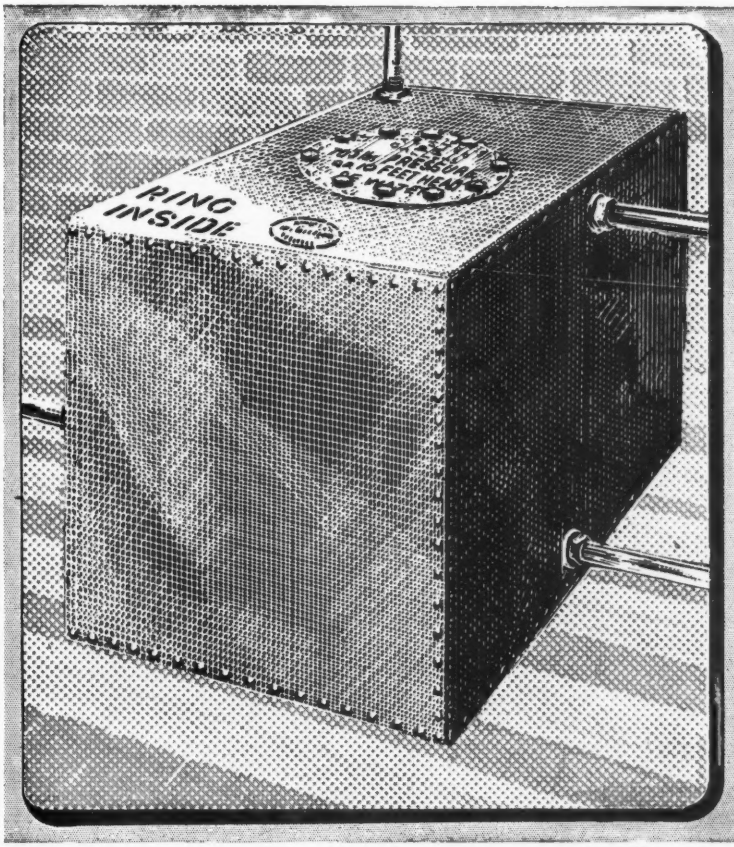

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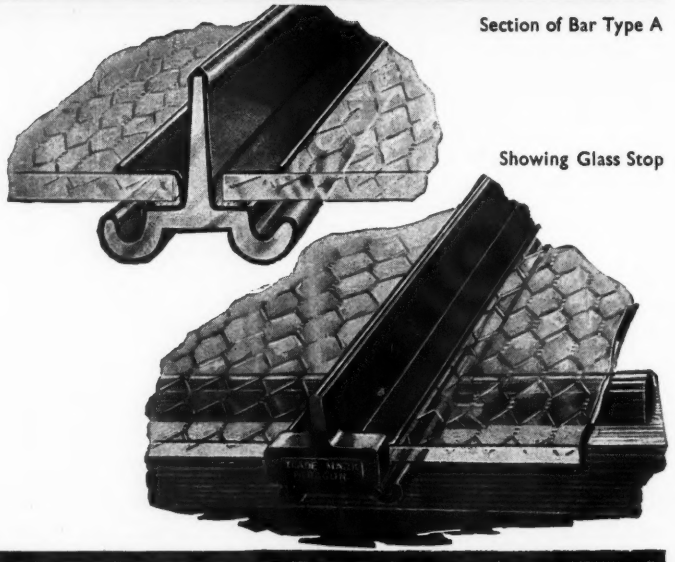

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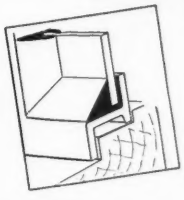

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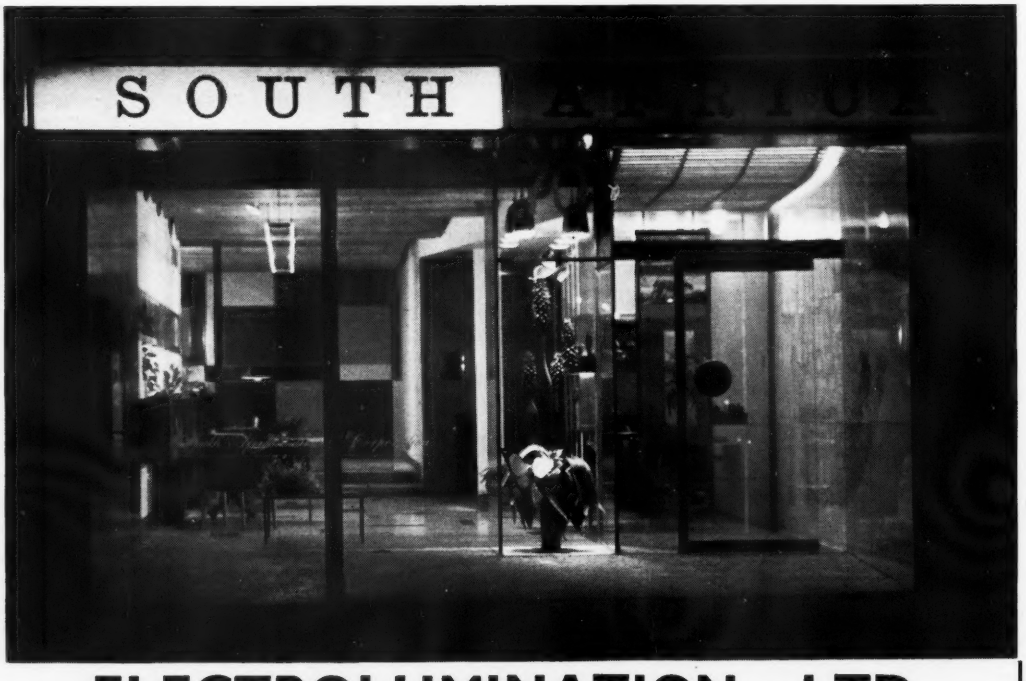

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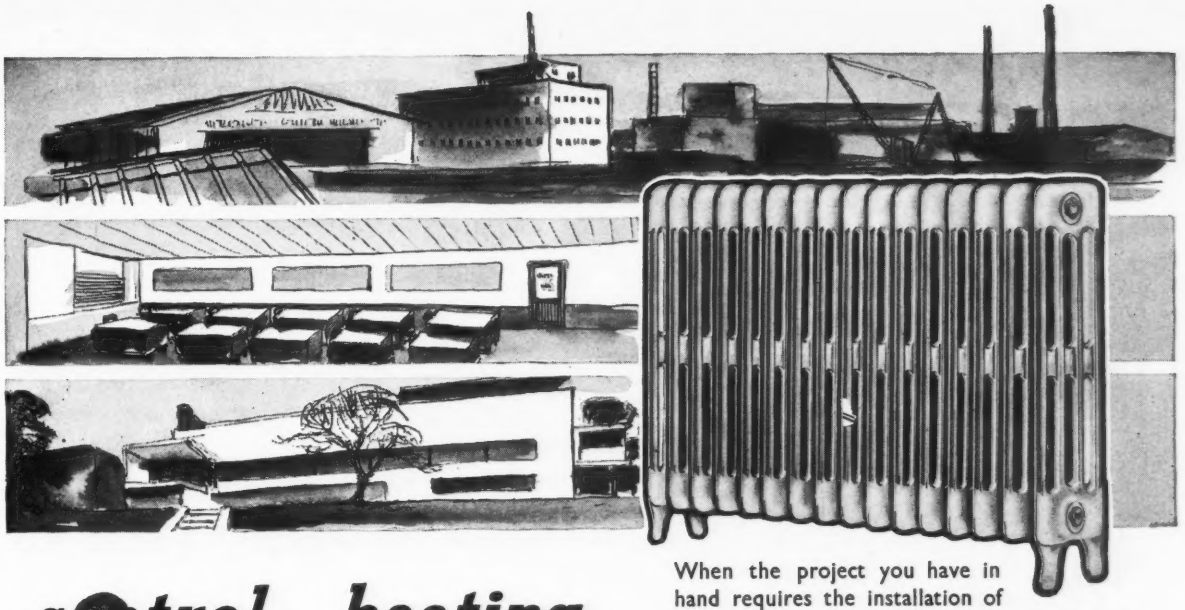

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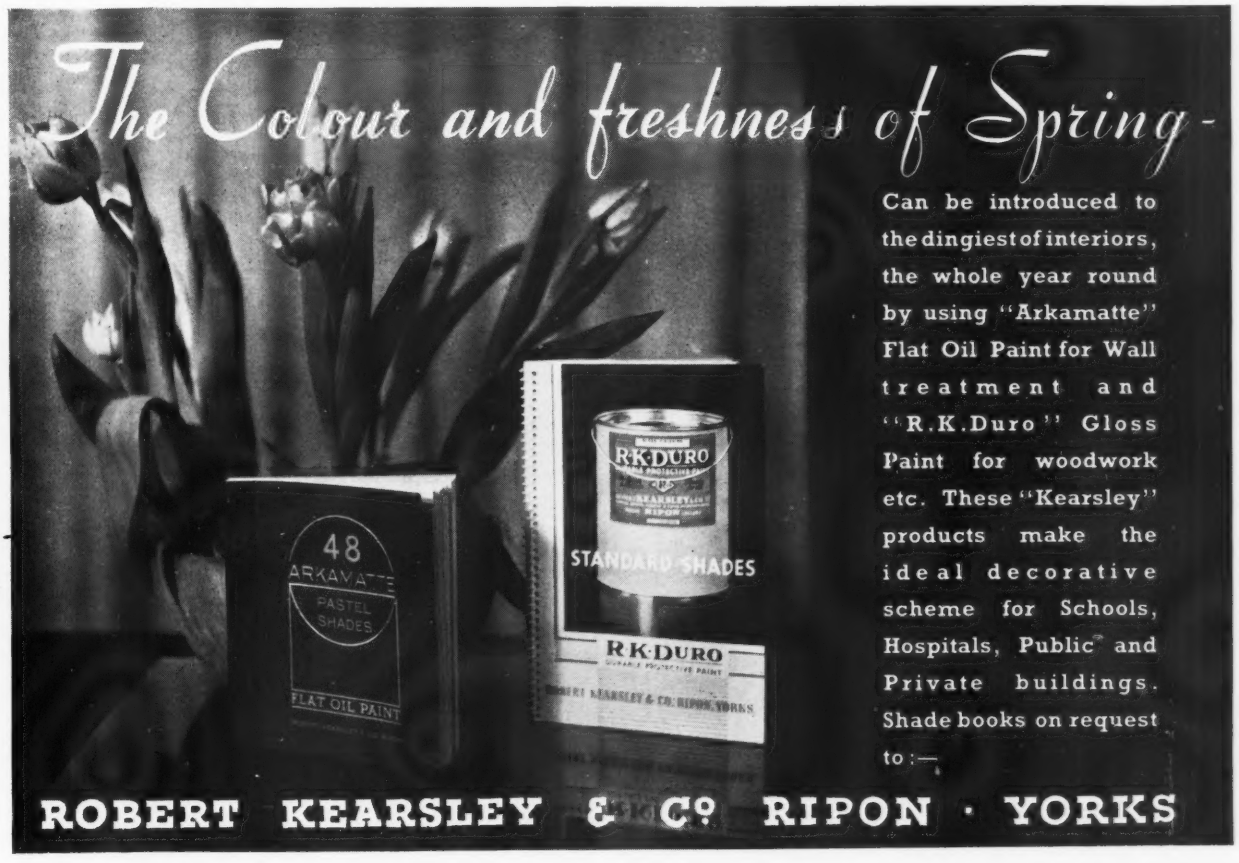

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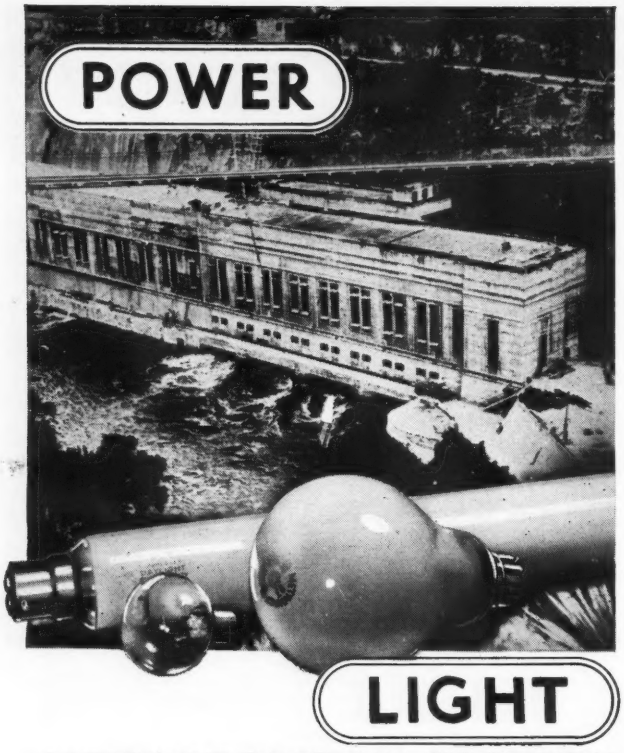

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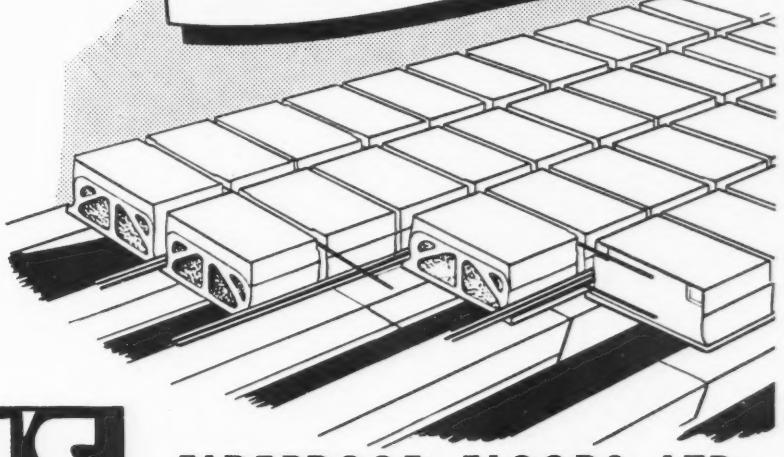

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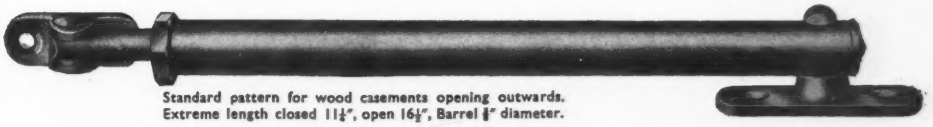

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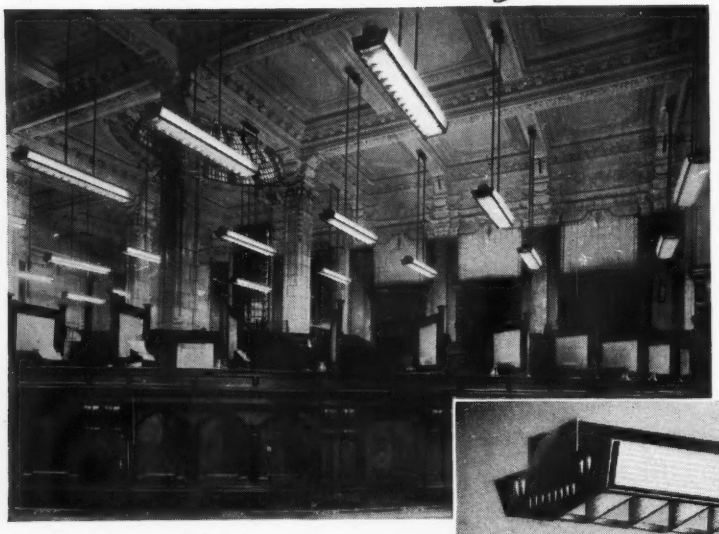

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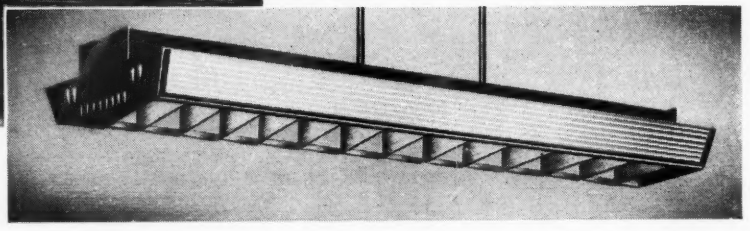

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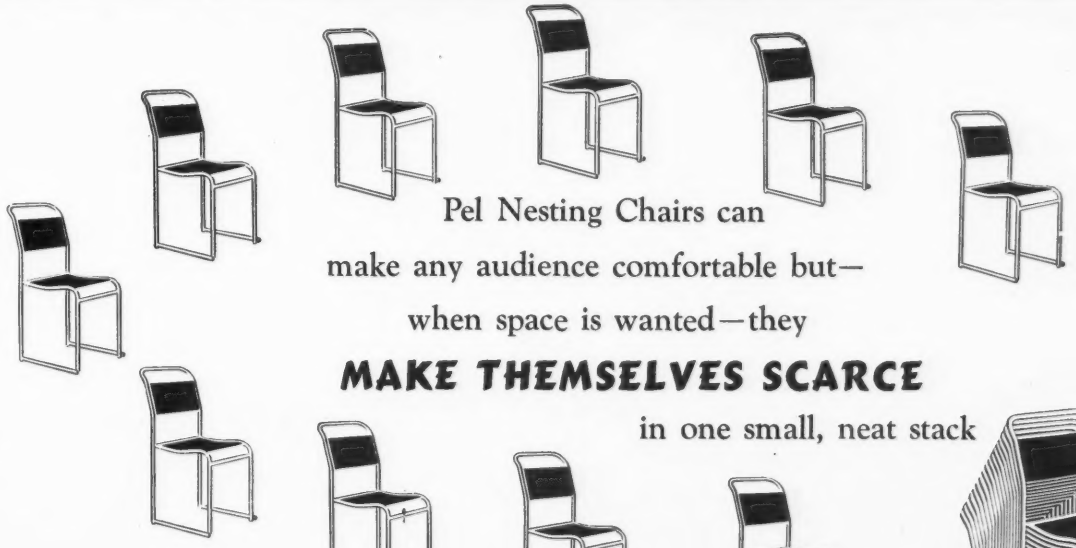

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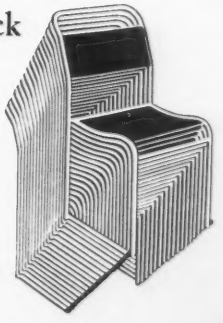

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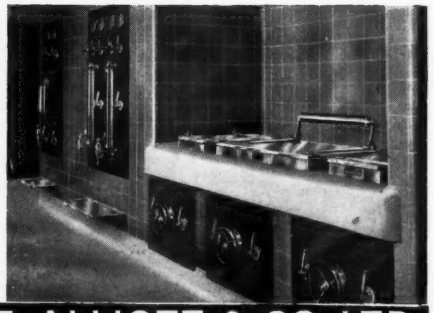

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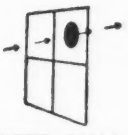

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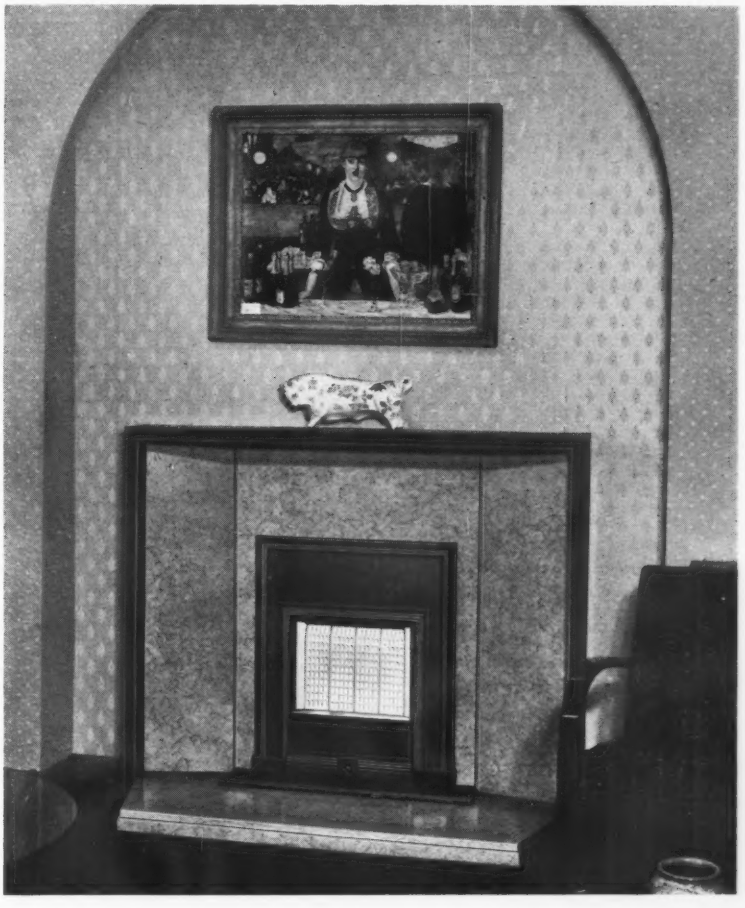

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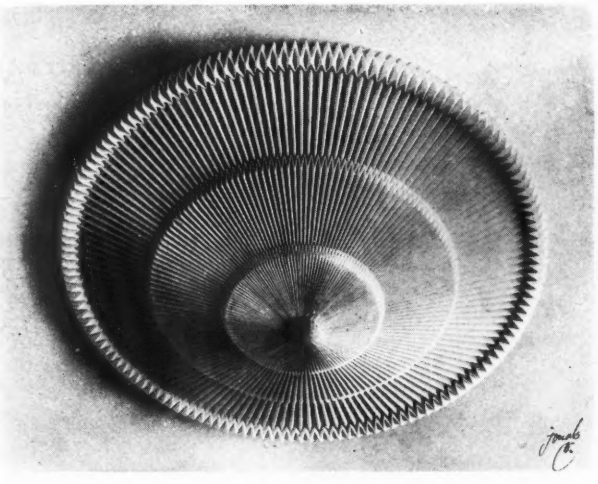

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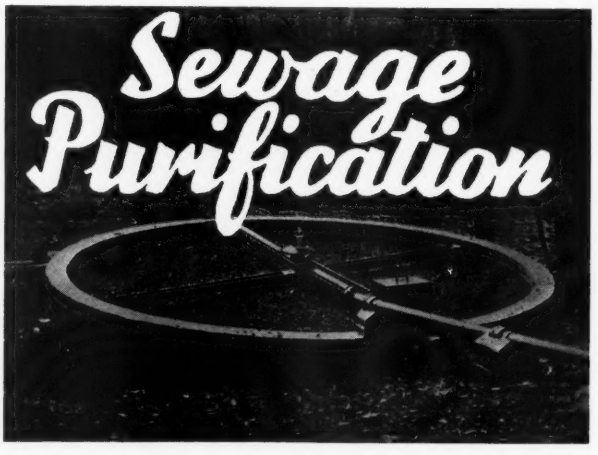

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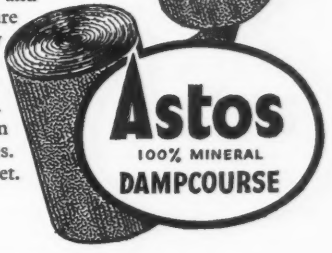

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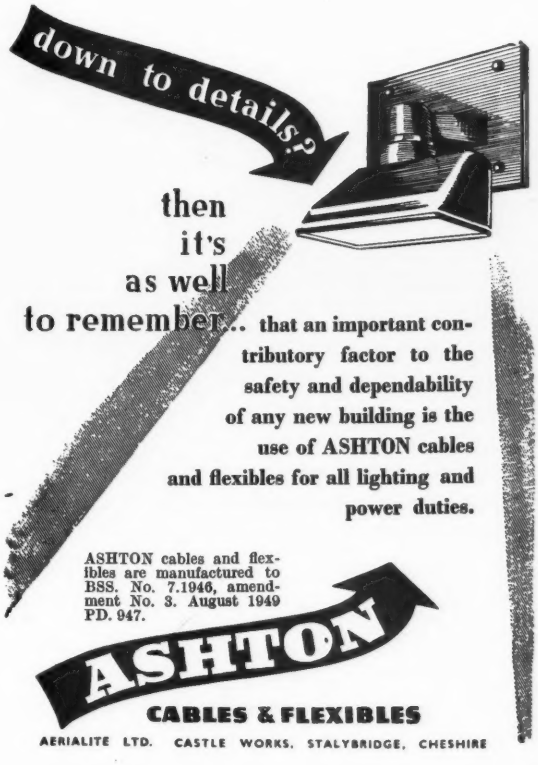

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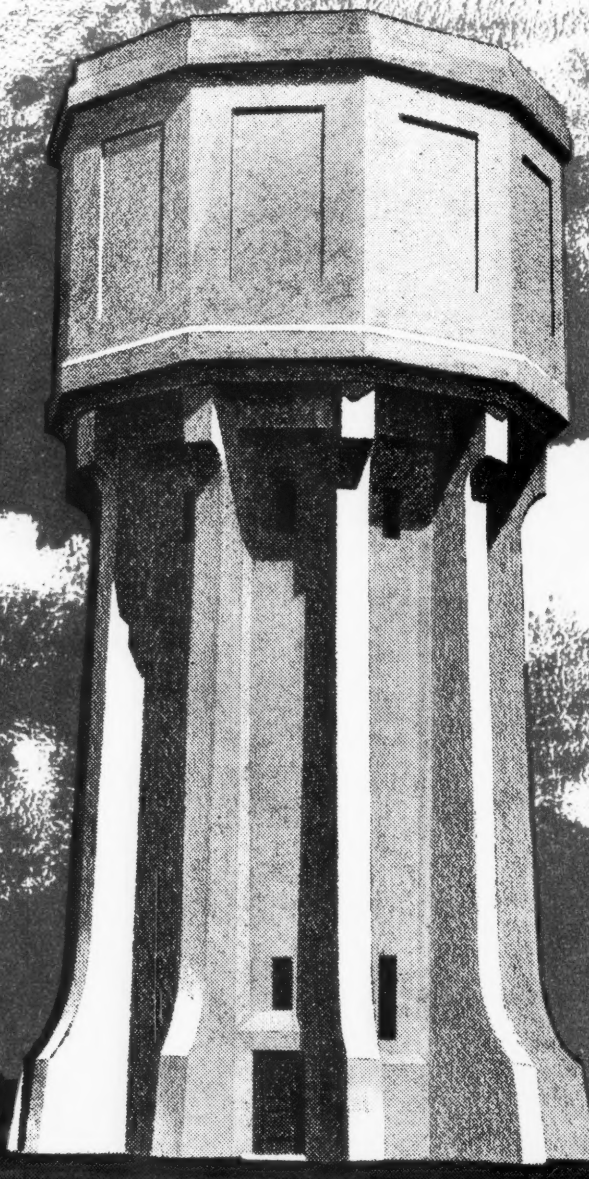

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